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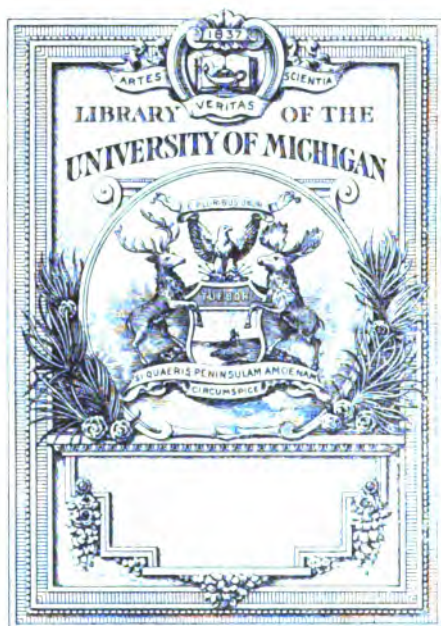
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AMERICAN ANTHROPOLOGIST.

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CONTENTS OF THE VOLUME.

	Page.
1. Distribution of Stone Implements in the Tide-water Country. By W. H. HOLMES.....	1
2. The Deadly Microbe and its Destruction. By D. S. LAMB.....	15
3. Geographic Nomenclature of the District of Columbia: A Report.....	29
4. Notes on the Chinook Language. By FRANZ BOAS.....	55
5. Primitive Distillation Among the Tarascoes. By JOHN G. BOURKE.....	65
6. The Rural School Problem. By JAMES H. BLODGETT.....	71
7. Archeologic Explorations in Michoacan, Mexico. By F. PLAN-CARTE.....	79
8. Man and the Glacial Period. By W J McGEE.....	85
9. The Poet—is he Born, not Made? By ROBERT FLETCHER.....	117
10. Simplified Spelling: A Symposium. By F. A. MARCH, A. R. SPOFFORD, W. T. HARRIS, ALEXANDER MELVILLE BELL, JOHN M. GREGORY, W. B. OWEN, E. T. PETERS, CHARLES P. G. SCOTT, JAMES C. PILLING, BENJAMIN E. SMITH, W. D. WHITNEY, J. W. POWELL.....	137
11. Time-keeping by Light and Fire. By WALTER HOUGH.....	207
12. The Last Town Election in Pompeii: An Archeological Study of Roman Municipal Politics, Based on Pompeian Wall In-scriptions. By JAMES C. WELLING.....	225
13. Are the Maya Hieroglyphs Phonetic? By CYRUS THOMAS.....	241
14. The Columbian Historical Exposition in Madrid. By WALTER HOUGH.....	271
15. Mythic Stories of the Yuchi Indians. By ALBERT S. GATSCHE. 279	279
16. Recent Archeologic Find in Arizona. By JAMES MOONEY.....	283
17. A Central American Ceremony which Suggests the Snake Dance of the Tusayan Villagers. By J. WALTER FEWKES.....	285
18. On the Evolution of the Art of Working in Stone: A prelimi-nary paper. By J. D. McGUIRE.....	307
19. Further Notes on Indian Child-language. By A. F. CHAMBER-LAIN.....	321
20. Prehistoric Irrigation in Arizona. By F. W. HODGE.....	323
✓ 21. The Navajo. By A. M. STEPHEN.....	345
22. A-wa'-to-bi: An Archeological Verification of a Tusayan Le-gend. By J. WALTER FEWKES.....	363
23. Piñon Gathering Among the Panamint Indians. By B. H. DUTCHER.....	377

(iii)

	Page.
24. Polysynthesis in the Languages of the American Indians. By J. N. B. HEWITT, with remarks by J. OWEN DORSEY.....	381
25. The Kuskarawaokes of Captain John Smith. By WILLIAM WALLACE TOOKER.....	409
26. Aboriginal Remains of the Piedmont and Valley Region of Virginia. By GERARD FOWKE.....	415
27. The World's Fair Congress of Anthropology. By W. H. HOLMES.	423
28. Anthropology at the Madison Meeting. By W J MCGEE.....	435

MISCELLANEA.

The navel in local names, 53;—Rising and falling of the sky in Siouan mythology, 64;—American Folk-lore Society, 64;—Ancient graves of the Vazimba, 69;—Makanga customs, 70;—Women of the Trobriand islands, 70;—Signaling by means of exploding leaves, 78;—Indiana Academy of Science, 84;—Stone-axe currency in British New Guinea, 84;—Book notices, 96;—Quarterly bibliography of anthropologic literature, 108;—Origin of certain mound relics, 113;—Whistle language of the Canary islanders, 115;—A Kachgai-Chinese menu, 136;—Slavery in eastern Africa, 136;—Book notice, 206;—Death of John G. Owens, 206;—The Brinton lectures, 206;—The means of distinguishing jadeite and nephrite, 210;—Quarterly bibliography of anthropologic literature, 211;—Abstract of the proceedings of the Anthropological Society, 218;—Mission Indian maturity ceremonial, 221;—The citizenship prizes of the Anthropological Society, 223;—Folk-lore publication, 270;—Folk-lore congress, 270;—Historic and prehistoric Mohawks, 277;—Tattooing in Tunis, 282;—Absence of crime in Bechuanaland, 282;—Physical anthropology of the Fuegians, 306;—Cranial deformities in Toulouse, 320;—Blood cement used by the ancient Hurons, 322;—The citizenship prizes, 330;—Quarterly bibliography of anthropologic literature, 331;—Liberian customs, 337;—Book notices, 340;—Japanese minor religious practices, 376;—How Indian songs are borrowed, 376;—Menomoni cult society, 407;—The Pennsylvania-German Society, 407;—“La mensuration du con,” 408;—The Terraba language, 408;—The Gundestrup silver vase, 414;—Annamite betel-chewing and salutation, 422;—Quarterly bibliography of anthropologic literature, 449;—Charles Colcock Jones, 457;—Topinard on anthropology in America, 459;—Mashonaland temple orientation, 462;—Finger prints in India, 462;—Book notice, 463;—Pin-wells and rag-bushes, 464.

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VOL. VI.

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No. 1.

DISTRIBUTION OF STONE IMPLEMENTS IN THE TIDE-WATER COUNTRY.

BY W. H. HOLMES.

The tide-water portions of Maryland and Virginia have an area nearly equal to that of the State of Maryland. About one-fourth of the area is occupied by broad arms of the sea, chiefly Chesapeake bay and its tributaries, and the land is a low but handsome plain broken by erosion into hills, valleys, and terraces. It extends inland from the Atlantic seaboard to the base of the highland or Piedmont plateau, which rises on the west to the Allegheny mountains. The curved line separating the two topographic divisions—the lowland and the highland—is marked by falls in all the rivers and by the location of towns and cities through which pass the great highways of travel connecting the north with the south. Upon this line are located Philadelphia, Havre de Grace, Baltimore, Laurel, Washington, Fredericksburg, Richmond, and Petersburg (see Pl. I). This was the shore-line of the Atlantic when the formations constituting the lowlands were laid down.

The separation of the lowland from the highland is not a topographic separation only, there are pronounced biologic and geologic distinctions, and these combined in archaic times to produce marked anthropologic distinctions. The tide-water region furnished a plentiful supply of game and fish, and in the brackish and salt water areas an abundance of oysters. The natives lived much upon the water and were perhaps more nearly a maritime people than any other group of tribes in the east. Their peculiar biologic environment had a marked influence upon their art, giving it unique forms and exceptional distribution, but their unusual geologic surroundings had a still more pronounced effect upon their

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implements, utensils, and weapons, limiting the forms and sizes and determining to a considerable extent the kinds employed in the various districts independently of biologic and other conditions.

In early historic times the tide-water country was inhabited by numerous tribes of Indians, mainly of Algonquian stock, subject to the renowned Powhatan. A few other nations were located about the headwaters of Chesapeake bay, and others appeared at times along the western and southern borders. The period covered by this occupation practically closed before the middle of the last century. Its beginning is not determined, but cannot extend very many centuries back into the past. Of antecedent or prehistoric peoples, if such there were, we have no information, for the art remains are simple and homogeneous, giving no hint of the occupation of this region by other than the historic tribes. The region is nearly identical with that explored by that intrepid and illustrious adventurer and colonist, John Smith, whose accounts of the natives are among our most valuable contributions to the aboriginal history of the Atlantic States.

The geology of the tide-water country is wholly unlike that of the highland, and the rocks available to the aborigines in the two regions were not only different in distribution but peculiar in the shapes they took and in other features that affect the character of the utensils made and employed. In the highland, west of the dotted line on the map, the varieties of rock occur in massive forms and with definite independent distribution. The workable varieties, such as quartz, quartzite, rhyolite, jasper, and flint, were much sought by the aborigines of the lowland. Fragmental material was to be obtained almost everywhere upon the surface, but choice varieties were confined to limited areas and often to distant regions, and where the surface exposures were not sufficient to supply the demand, quarrying was resorted to and the work of securing, transporting, and trading or exchanging the stone must have become an important factor in the lives of the people. The masses of rock were uncovered, broken up, and tested, the choice pieces were selected and reduced to forms approximating the implements to be made, and in this shape were carried to the lowland.

In the lowland all varieties of hard stones are fragmental and the species are intermingled in varied ways. These fragments of rock are not merely broken angular pieces, such as characterize the surface of the highland, but are rounded masses and bits, known as

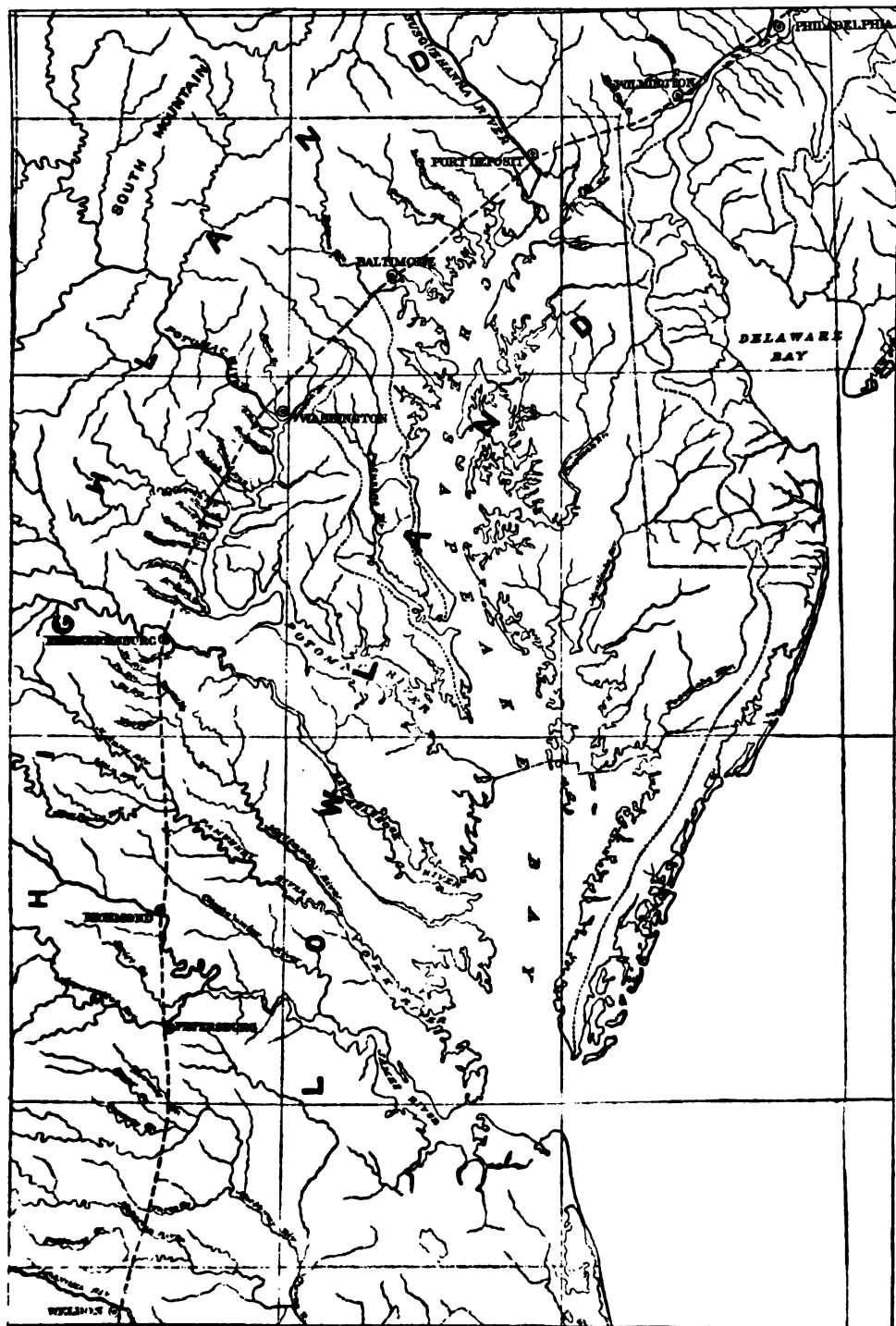


PLATE I MAP OF THE CHESAPEAKE TIDE-WATER REGION

boulders, cobbles, and pebbles, and comprise chiefly such tough, flinty, homogeneous stones as are available in the arts of primitive men. Nature, in her own way, selected from the highland along the stream courses the very choicest bits of the crumbled rocks, reduced them in hundreds of cataract mills and in the breakers of the sea shore to rounded forms, and deposited them here in the lowlands in great heaps and beds ready to the hand of primitive man.

At first it would seem, to even the keenest observer, that a cobblestone or ovoid boulder or pebble would be a difficult form of stone to utilize in making knives, spear-points, arrow-points, drills, and scrapers. The smooth rounded mass had to be transformed into a thin blade, every contour of which is incisive or angular. So far apart are the two classes of forms that few people have thought of the boulder as a prominent source of these objects, but when we look into the matter more carefully we find that nature has not provided any other form or conformation of the several tough varieties of stone so perfectly suited to the purposes of the stone-implement flaker as the boulder or pebble.

Each river brought down from the highland only such varieties of stone as belonged to the drainage of that river, so that in one valley one set of materials prevails and in another a different set of materials appears, varying with the geologic formations of the region drained. Rivers having identical formations will have nearly identical boulders. Long rivers crossing numerous formations will have many varieties, short rivers crossing but few will have but a limited number.

There is also a selection as to size by each drainage way. Near the base of the highland, where the force of the current is reduced by meeting tide-water, the larger boulders are dropped, the smaller ones are deposited farther down, and the pebbles and sand are carried far seaward. Small and weak streams transport fewer pieces and drop them sooner. This selection does not hold good with ice transportation, which agency has carried irregular masses of stone to many widely distributed points. Notwithstanding the fact that all water-transported stones are more or less rounded, there is a selection with respect to degree of roundness. If dropped early in the progress of transportation the boulder is imperfectly rounded; if carried far, it is fully rounded. Near the margin of the highland, therefore, there is a large percentage of imperfectly rounded stones, and farther out there is a small percentage of irregular forms.

These conditions are probably considerably modified by the action of the waves along the ancient sea-shore which skirted the base of the highland. Such fragments as were subjected to wave action became fully rounded and were deposited in beds along the ancient beach lines. It is not easy to distinguish the beach-rolled material from that rounded by the flow of streams, both agencies having, no doubt, frequently acted in turn upon the same material.

Again we observe that on river banks near the base of the highland many varieties of rock are present, but with each mile as we descend the number is diminished, the softer species are reduced to sand as they move toward the sea and one after another disappears. Quartz, being the hardest, is last to yield to the erosive agents, and at various points along the ocean beach well-polished quartz pebbles are found.

A comparison of the Potomac and Patuxent rivers, with respect to these points, is instructive. In ancient times both streams as they descended from the mountains gathered fragments of rock and carried them downward until the soft and friable ones were reduced to sand and the tough, flinty varieties became boulders and pebbles. The latter consisted chiefly of quartz and quartzite. The Potomac was a long stream, heading far to the west and cutting through many ranges of mountains and hills. It crossed heavy beds of quartzite in the region of Harper's Ferry. This rock is tough and massive and breaks up into rather large fragments; thus it is we have many large quartzite boulders deposited in the valley about Washington and below, the sizes diminishing toward the sea. Between Harper's Ferry and Washington the river crosses a belt of gneissic rocks intersected by many veins of quartz. This latter rock is hard and brittle and breaks up into small fragments, which, when rounded, are usually of the size denominated pebbles. These were taken up by the waters in countless numbers and distributed with the quartzite boulders from Washington to the sea; but the quartz is harder than the quartzite and resisted the erosive agents more successfully, so that after the quartzite disappears there are still quartz pebbles in plenty.

The other stream, the Patuxent, has a limited drainage and does not cross the quartzite belt, but drains the quartz-bearing belt. Below the point of its entrance into the tide-water country at Laurel we find of the flakable stones chiefly quartz in small fragments; lower down all are well rounded, forming pebbly gravels.

It is thus seen that nature has selected the rocks used by the tide-water peoples and has distributed them in groups varying with original location, with hardness, with toughness, with shape, and with size.

The effect of these conditions of distribution upon the stone art of the various districts was necessarily very pronounced. One community located conveniently to deposits of large boulders used large stones, and the tools shaped from them average large. Another community located in a pebble-bearing district utilized pebbles, so far as they were capable of utilization, and this people had few large tools and many small ones, the average size being very small. Dwellers in quartzite-bearing districts had quartzite tools; those having quartz deposits had quartz tools, and those residing near the base of the highland had many varieties of stone, and hence used a much greater diversity of stone tools, since the working qualities or capacities of each stone varies from the rest.

As a result of these conditions the tide-water Potomac is rich in chipped tools both of quartzite and quartz of home production. The Patuxent yields a large percentage of quartz tools, most of which are native. The Potomac yields to the collector a large percentage of large tools; the Patuxent a large percentage of small ones. These remarks relate to the native varieties of material and implements made from them. Exotic materials had their own peculiar distribution, which will be examined farther on.

Nearly all rude, bulky implements of chipped stone and all failures or rejects of manufacture are, as a matter of course, found upon or near the sites from which the raw materials were derived. Rejects are large and clumsy on the upper tide-water Potomac, because of the large size of the boulders available. They are small on the Patuxent, because the pebbles utilized were small.

Again, the percentage of the failures—the turtle backs and other refuse of manufacture—decreases rapidly with the distance from the source of supply of the raw material, extending little beyond it. This may be illustrated. In the vicinity of Washington we have a great deposit of quartzite boulders. In Fig. 1 the dotted line may be taken as roughly indicating the workable boulder-bearing area, and the angular markings show the distribution of rejects of manufacture. The successful blades and the finished tools produced would radiate much more widely, but would also diminish with distance from the source of supply, as indicated by the small strokes

in Fig. 2. Favorite routes of travel would receive the fuller supply of these objects, and dwelling and important hunting and fishing sites would have large supplies, as indicated by "village site" in Fig. 2. On the source of supply of the raw material failures and finished implements or rejects would exceed finished implements in numbers, but beyond this the latter are almost wholly prevalent. So-called paleolithic forms—the rejects of manufacture—are thus confined to limited areas, the areas producing the raw material; and it is easy to see how in various sections of the country before



FIG. 1.—Distribution of rejects of manufacture with respect to distribution of raw material.

the true nature of these forms was known certain localities were thought to have been especially favored by paleolithic man.

It would thus appear from what has been said that the artificial distribution of materials is limited by—is a modification of—the natural distribution, and that each class of artificial object is scattered in a way peculiar to itself; but the human agent is an important factor. Other things being equal, human distribution of small things is far, of large objects near; implements of war and

the chase travel far, domestic utensils remain near; improvised articles or devices are near, highly elaborated and valuable objects go far; with thoroughfares distribution is far, across thoroughfares it is near. Much-occupied sites are richly stocked with utensils, and slightly occupied spots have but few; sites near the source or sources of supply have a wealth of art, very distant ones have almost nothing; sites convenient to a plentiful supply of one material have many tools of that material, sites remote from any of

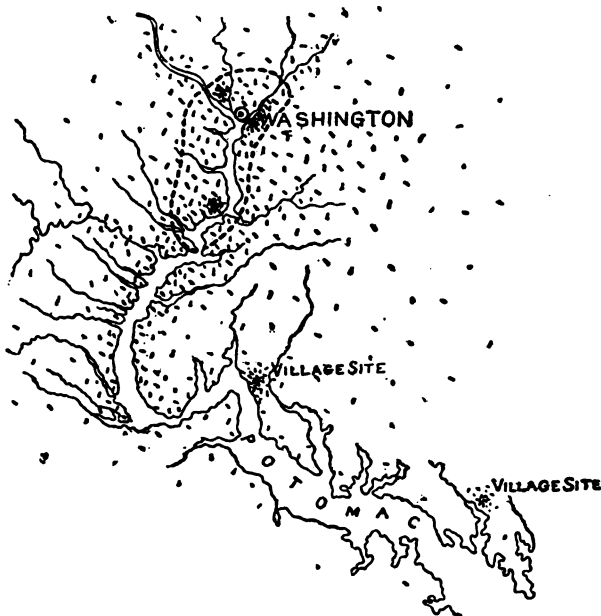


FIG. 2.—Distribution of implements with respect to distribution of raw material.

the sources have a limited supply from many sources. A sedentary people will not distribute widely; wandering or semi-sedentary tribes will transport their possessions to many distant places, and sites occupied by numerous tribes in turn will have diversified art remains. It may be further noted that on sites devoted to single or simple industries the range of tools will be small and on sites where occupations were varied the range will be large, and that

where peoples were varied, occupations varied, materials varied, and time long we will have the widest range.

The tide-water peoples were by no means content with the materials supplied by the province in which they lived, although these naturally received first attention. Not being favored by nature in the quality and range of their materials, they seem to have searched far and near for those finer-grained homogeneous varieties so much used in other regions. They sought flint in the mountains of Virginia fully a hundred miles beyond the tide-water limit; they discovered a slaty-appearing volcanic porphyry, called rhyolite, in South mountain, 75 miles northwest of Washington, and jasper and argillite were obtained from eastern and northeastern Pennsylvania. It is probable that in some cases the tide-water peoples made long journeys in search of these rocks and spent short seasons quarrying and roughing out the blank forms and selecting choice bits to be carried home. On the other hand, much of the material from these distant places may have reached the lowland by exchange or trade, and a certain amount, not ascertainable, of the supply of implements of exotic materials is no doubt due to visits and incursions by peoples occupying the region of the source of supply; for example, jasper may have been brought by the Susquehannocks of the north, and flint by the Monacans of the west. It may be that in time, by careful comparison of the forms of implements characterizing the various exotic materials, something may be suggested of the presence of neighboring peoples in or at least of their influence upon the art of the tide-water region. Distribution is very general, implements made of all of the varieties of stone mentioned being scattered more or less fully over the Chesapeake-Potomac country as far south as James river.

Jasper, the quarries of which have recently been located by Mr. H. C. Mercer, of Philadelphia, is more plentiful in the upper Chesapeake and Susquehanna regions. Argillite, which was obtained in the Delaware valley, did not find its way to any great extent into Maryland and Virginia, although several caches of blades have been discovered in the middle Chesapeake region, and implements are occasionally found. Rhyolite implements are most plentiful in the Patuxent and Potomac valleys, and especially in those portions of them adjoining South mountain. The quarries of this stone are in Pennsylvania, near the head of the Monocacy, and the implements are very numerous on that stream, and fragments of considerable size have been carried far down the Potomac.

Transportation was no doubt mainly by water. Probably one-fourth of the spear and arrow points of the Potomac region are made of this rock. Flint of a dark or blackish hue was used in making smaller projectile points, as were also quartz and jasper. These materials, breaking naturally into small pieces, were not well fitted for the making of large implements.

It should be noted that of these exotic materials we have in the tide-water country very few large or rude implements, and, as a matter of course, failures of manufacture are rare, save those that result from breakage during such specializing and finishing operations as were conducted subsequently to transportation from the quarry. Of quartz and quartzite, the native flakable stones, there are countless rejects of manufacture of all grades, as previously described.

It may be said of quartzite and quartz that a portion of these materials—perhaps a large portion, especially of the latter—were secured from the highland beyond the tide-water limit, and no one can say from the examination of ordinary finished implements of these materials whether or not they were made from a native boulder or from a foreign mass or flake; but the presence of countless numbers of the rejects of manufacture from quartz and quartzite boulders and pebbles within the tide-water area, and the rarity, so far as I have been able to discover, of refuse of manufacture in the highland, seem to make the true conditions clear.

Cut, pecked, ground, and polished implements of usual types are common in this region. Soapstone, used in making pots, pipes, sinkers, and ornaments, was quarried in hundreds of places along the eastern border of the highland. The unfinished objects are found on the quarry sites and upon dwelling sites near by. The finished utensils and implements are scattered far and wide, but grow less plentiful as we approach the Atlantic coast. The picks and chisels used in working the soapstone are confined to the quarries and their vicinity.

Axes, celts, and the like were made for the most part of tough boulders of volcanic and granitic rocks obtained from the stream-beds or from the highland. Failures resulting from the manufacture of these implements are frequently found upon village sites along the banks of the larger streams. Rejection or failure was not uncommon even after the pecking operations began, and breakage under the pecking hammer was not rare. It is important to observe

that in many cases these implements were reduced to approximate shape by flaking, and this has given rise to several classes of flaked rejects, peculiar in shape and exceptional in material. These objects are of such rude forms that they are sometimes mistaken for very primitive implements, thus providing another trap for the unwary paleolith hunter.

The liability of the various stone implements of the tide-water region to transportation is approximately expressed in the following partial list. Beginning with those least subject to transportation and ending with those most subject to it, we have the following tentative order:

Mortars, generally improvised from boulders having at least one concave surface which was gradually deepened by use. They were probably rarely far removed from the site of their first utilization. Many improvised tools and utensils, mullers, pestles, hammer-stones, etc., were equally home-stayers, as they were merely natural shapes picked up and adapted to the needs of an occasion.

Sharpened boulders, improvised chopping or bone-breaking tools, occur on all river sites where boulders were at hand. The edge or point was made by removing one or more flakes. They were not transported far beyond the limits of the boulder-producing area.

Notched and sharpened boulders, improvised axes, picks, or hoes, closely related to the preceding, but intended to be hafted. Their transportation was but slight, as they are rarely found beyond the range of deposits of heavy boulders. Half a dozen blows with a hammer-stone were sufficient to fashion one of these objects.

Picks and chisels for working soapstone traveled but little beyond the quarries and the neighboring villages where the finishing was done. These consist of rude, sharp stones, of axes and celts worked over or "upset" to secure good points, and of thick leaf-shaped chisels reduced to approximate shape by flaking and then ground to an edge at one or both ends.

Net sinkers are not common and are usually rude. They were probably carried back and forth to some extent along the streams.

Pestles, cylindrical stones symmetrically shaped and well finished by pecking, were apparently carried from place to place and perhaps for long distances.

Hammer-stones: Many of these objects were improvised from boulders and were quickly cast aside, as already indicated, but others were carried far out into the non-boulder-bearing region, where they acquired by use or were given purely artificial contours.

Soapstone vessels are widely distributed, reaching in rather rare cases points 100 miles or more from the highland in which the material was quarried.

Grooved axes, celts, scrapers, drills, knives, spear-points, arrow-points, as well as *pipes* and *ornaments*, were freely transported, covering the full range of the peoples employing them, and not infrequently, no doubt, passing from district to district through other hands.

Rejects resulting from failures in specialization of transported forms and from attempts at remodelling of worn or broken tools are to be found everywhere, but rejects of the roughing-out processes are not seriously affected by the transporting agencies, remaining mainly upon the shop sites.

Some of the eccentricities of distribution may be illustrated by examples, sites having varying relations to the deposits of raw material being chosen for the purpose, as follows :

1. On a site of quarrying and manufacture where dwelling was inconvenient, as on the bluffs of Rock creek, the work was confined mainly to roughing out leaf-shaped blades, and the series of art forms comprise a limited range, including turtle-backs and other kinds of rejects and refuse. Nothing exotic, nothing finished, nothing that might not readily be classed as "paleolithic" by our American advocates of the idea of a rude stone age, was found in three months' work upon the shop sites of Rock creek.

2. On a site of quarrying and manufacture where dwelling was practicable and where lodges were actually pitched to a limited extent, we find intermingled with the rude forms some specialized ones and a few tools of exotic origin, such as projectile points of rhyolite and axes and celts, as at Riggs' mill, eight miles northeast of Washington.

3. On a site of manufacture and at the same time of extensive dwelling, as at Anacostia, D. C., where much raw material was at hand, all varieties of refuse and of rude forms are found ; likewise well-shaped and wholly-finished specimens of flaked tools of local origin prevail. There are also all the cut, pecked, and polished tools and ornaments common to village sites. Besides these, many exotic materials in varied forms are found.

4. On a village site where no raw material, save small quartz pebbles, is found there will be a full range of small quartz rejects and of small quartz implements, with a liberal supply of finished implements of exotic materials averaging small.

5. On a site remote from all sources of raw material, as on the eastern shore, the objects average small and are much varied in material and style, having come far, through numerous peoples and from many sources.

Typical illustrations of the two last-mentioned varieties of sites are difficult to find, for the reason that in all sections, even far out toward the present ocean beach, there are occasional ice-borne boulders and fragments of considerable size, and these were collected by the natives and used for mortars, mullers, and for various flaked and pecked implements, and such objects destroy the entire simplicity of conditions conceived for the sites described.

A synoptical statement is made in the accompanying plate (Pl. II) which exhibits many of the most striking features of the flaked-stone archeology of this province, and indicates clearly the points most requiring attention in other regions. The stories of the origin and form of the materials, of manufacture, rejection, elaboration, transportation, storage, specialization, and use are all expressed or suggested. Four materials are represented, two native, in the form of boulders, and two exclusively exotic and derived from mass deposits. Each series indicates the course of development through which most of the finished forms passed between the first stroke given to the shapeless stone and the finished work of art.

In the first and second series all the forms, from the boulder to the most minute art shapes, are represented in solid lines, being exclusively tide-water art. Nos. 1, 2, 3, 4, 5 and 6 are shop rejects, turtle-backs, etc., and are not implements. Nos. 7, 8 and 9 are roughed-out forms, blanks, blades ready for further specialization, and are not necessarily implements, although they were available as knives and scrapers. The numbers from 10 to 18 are specialized forms derived mainly, no doubt, from boulders, and include knives, spear-points, arrow-points, and perforators or drills.

The second series comprises forms derived mainly from quartz pebbles, and which are naturally smaller than the quartzite forms. They are drawn in solid lines, being of native derivation. Nos. 1, 2, 3, 4, 5, 6 and 7 are shop rejects, turtle-backs, and are not implements. No. 8 is a profile, showing the ordinary "peak" or hump of the reject. Nos. 9, 10 and 11 are successful blades, which may have been employed as knives or scrapers, but were usually intended for specialization into arrow-points, spear-points, perforators, etc., as indicated in Nos. 12 to 20.

The third series, consisting of objects of rhyolite, is drawn

partly in solid lines and partly in dotted outlines. Those in solid lines comprise transported and specialized objects and were collected in the tide-water country. Those in dotted lines *a*, *b*, *c*, *d*, *e* and *f* are the rejects of manufacture and are not found in the tide-water country, being obtained only on the quarry-shop sites in Adams county, Pennsylvania. The successful blades, illustrated in *g*, *h* and *i*, were carried away from the quarry to be used as they are or for specialization when the succeeding forms, *j* to *q*, were needed. The whole tide-water province is abundantly supplied with all the forms from *g* to *q*.

The fourth series, composed of articles of jasper, repeats very closely the conditions of the third or rhyolite series. The sizes average smaller on account of the minuter cleavage and inferior massiveness of the rock. The rejects of manufacture, indicated in dotted lines, are obtained mainly from the recently discovered quarries in eastern Pennsylvania. Other quarries may yet be found, and some of our rivers furnish occasional bits and pebbles of this material. The cache and finished objects, *g* to *q*, are widely scattered over the tide-water region.

Stone implements have been studied as to form, material, and use, but there has been no systematic study of manufacture, and origin and distribution have been greatly overlooked. It is of the utmost importance that in taking up the stone implements of a region each leading material be traced back to its source, so that from this point of view a study can be made of the work of quarrying, shaping, transporting, and finishing. Each form or class of implement will thus be found to have left in its wake a trail of "wasters" or rejects peculiar to itself. Until these are understood, selected, and set apart there is necessarily much confusion.

It is seen by a study of Pl. II that a half or more of the native flaked forms of this region are actually not implements. The separation is approximately indicated by the upper braces marked "not implements" and "implements." It will be observed that this division separates the cache forms or blanks of the middle column into two parts. Portions of this class of objects were mere quarry shapes distributed to be elaborated when needed, but some of them were probably utilized in their blank shape as knives, etc., and some show a slight degree of specialization, as in No. 9 of the first series, and thus properly take their place with implements. Nearly all of the specimens shown in this vertical column are actual cache finds.

This study brings out other features of flaked-stone art which have not been understood and have thus given rise to much embarrassment and to much useless discussion on the part of those who have been talking of rejects as implements. Each material gives different forms of rejects. Each form of material gives its own styles of rejects. Each implement leaves its own peculiar rejects. If in the tide-water country six varieties of stone were used in the manufacture of flaked implements, if two of these materials occur in distinct forms and if one of them was employed in making two distinct types of implements, then there would be found here ten lines of refuse or "wasters," each furnishing its own peculiar types of rude forms. Several of these genetic lines have already been, as illustrated in Pl. II, more or less fully traced, and the rejects separated from the implements. In other sections of America and in certain provinces of Europe there may be many more than ten distinct evolutionary series, and in Europe so many centuries and successive culture periods have passed and so much has been obliterated by thousands of years of metal-age occupation that the phenomena there must be both complex and obscure. It is plain, therefore, that if the European students of rude flaked stones have not been more discriminating than most of their pupils in this country, there is still work to be done there.

The distribution of cut, pecked, ground, and polished stone implements, and the refuse of their manufacture, is governed by laws similar to those governing the distribution of flaked stone.

Each province, district, and site, here and elsewhere, is supplied with art remains brought together by the various agencies of environment—topographic, geologic, biologic, and ethnic—and the action of these agencies is to a large extent susceptible of analysis, and this analysis, properly conducted, constitutes a very large part of the science of prehistoric archeology.

It would be instructive to examine in this place, so far as is possible, the effect of the distribution of the various kinds and forms of stone upon the habits, customs, arts, industries, etc., of the inhabitants of the region, for it is plain that so important an element of environment must have a most decided influence upon all departments of culture, but such a study would carry me far beyond the limits set for this sketch; besides, such a work can be conducted to better advantage where all the phenomena of human existence are observable as with living tribes, and the laws of culture evolution thus derived are applicable to all cases and fully answer the needs of anthropology.

EXPLANATION OF PLATE II.

This synoptical grouping of the ordinary varieties of flaked stones found in the tide-water country will, in a great measure, serve as a key to the whole subject of flaked stone art in eastern North America, and will suggest a practical method of treatment for all sections. Varieties of flaked implements not included in this series are of rare or exceptional occurrence or belong to what I have designated extemporized tools.

Specimens drawn in solid lines are obtained from the tide-water region. Those in dotted lines are not found, save in rare cases, within that region, having been left as refuse in the quarries in Pennsylvania from fifty to two hundred and fifty miles away.

The two upper lines have their genesis mainly in bowlders and pebbles; the lower lines are derived from materials quarried from the mass. The left-hand vertical column contains usual forms of failures, rejected in most cases on account of defective fracture which resulted in too great thickness, thinness being essential. Our so-called "paleolithic implements" belong in this column.

The middle column contains blades derived as indicated in the left-hand column. They were carried away from the quarries and shops to be used as they are or to be further elaborated. They are often found in caches or hoards where they were left by owners or traders. Some are slightly specialized, as *g* in the first line and *i* in the third line.

Quarry products at the transportation stage are necessarily not uniform in character. The blades, etc., accepted and carried away at one time may be ruder or less finished than those accepted and carried away at another time. In the third line, *f*, a reject from the quarry refuse may be more refined in shape than the transported and cached form *g*. Transporting and caching of raw material on the one hand and of finished implements on the other are not unknown, but caching was mainly the result of transporting and storing of roughed out implements in quantities not at once needed, and this was usually due no doubt to the intermittent nature of quarry production.

The right-hand column contains series of specialized forms, arrow-points, spear-points, knives, drills, etc., derived in the main as indicated in the genetic series. The smaller points were often made, no doubt, from small fragments or chips, but the process was essentially the same.

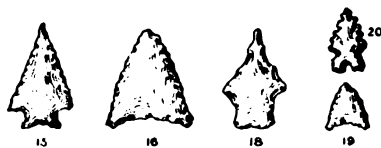
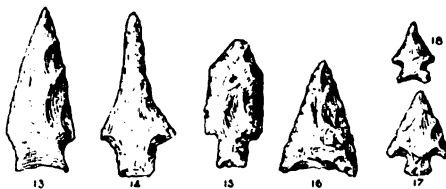
The process employed in roughing out and in the earlier stages of specialization was that of free-hand percussion with hammer-stones. The finishing was probably mainly by pressure with tools of bone.

The grouping as indicated by the braces should be carefully studied.

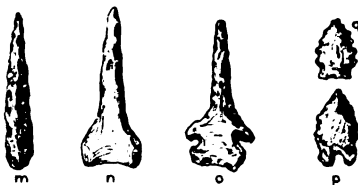
ments.

Specialized forms.

Native Materials.



Exotic Materials.



The scale varies from $\frac{1}{4}$ to $\frac{1}{2}$.

THE DEADLY MICROBE AND ITS DESTRUCTION.

BY D. S. LAMB.

Microbes, Micro-organisms, and Germs.—There may have been microbes, there doubtless were, away back in prehistoric ages, perchance before the time of the great lizards and pterodactyls. Béchamp believes that he has isolated living microbes from the chalk of the Secondary Epoch, and Dr. Gautier claims to have recognized the odor of their remains in prehistoric guano, in bone caves of the Stone Age and age of the Cave bear. If all this is true, it shows astonishing vitality in these minute organisms. Not until that famous Dutchman, Anton Leuwenhoeck, looked through his microscope into some rain water and, for the first time in the history of the world, saw forms of minute life, not till then, in April, 1675, 217 years ago, did there dawn upon mankind the possibility of knowing anything of the microbes.

The improvements in the microscope have given us better observations and more exact results. The significance of many things at first but imperfectly understood is now better known. For instance, Dr. Pollender in 1855 and Dr. Brauell in 1858 noticed in the blood of animals dead of anthrax or the splenic fever numerous fine thread-like forms, which multiplied by division. It was reserved for that greater observer, Davaine, to recognize that these little threads were microbes and were the cause of the disease. This discovery was but the beginning of a long series, the end of which is not yet. There are at least 185 known microbes.

The origin of the word microbe was on this wise : At the meeting of the Academy of Sciences, Paris, March 11, 1878, there was a prolonged discussion as to whether these minute beings were animals or plants, microzoa or microphyta. Dr. Sédillon, as a sort of compromise, suggested that they be called microbes, which means small living beings. His suggestion was adopted. Since then, however, it has been settled that they are vegetal, having a cellulose covering, deriving their nitrogen from the salts of ammonia and nitric acid like other vegetal bodies. Their protoplasm, however, contains no chlorophyll or green coloring matter, and so is unable to decompose

the carbonic acid of the atmospheric air ; they are thus closely allied to the fungi. In some microbes the protoplasm contains sulphur or phosphorus ; in others it does not. The effect of this difference in the chemical elements of their protoplasm is a varied reaction with staining agents, and this quality is a means of more readily identifying the varieties.

Microbes vary much in shape, and are named accordingly. The round or oval shaped is called a coccus. It reproduces itself by dividing into two of the same kind. These two together are called a diplococcus ; these by subdividing may make a quartette, called a tetrad or merismopedia. Sometimes the subdivision forms a chain, called, therefore, a streptococcus. Each one of the subdivisions is a distinct and independent individual. The micrococci are also called spherobacteria.

Another form is the rod-shaped ; the ends more or less rounded. This is called a bacterium or a bacillus ; if somewhat curved in shape, often called vibrio. Heretofore the distinction between the bacterium and bacillus was mainly one of length ; but it was soon found that this was not a very reliable distinction, and at the present day the name bacterium is applied to those which multiply only by division, while the name bacillus is given to those which have also the power of developing what are called spores. This whole group is also called microbacteria and desmobacteria. Another form yet is a spiral rod, called spirillum ; called also spirobacterium.

Still another form is the long thread or filament, called, when straight, a leptothrix ; when wavy, a spirochæta.

The manner of reproducing by division or fission, as it is also called, has given to all of these microbes the name schizomycetes. It is worth while to mention that in nearly all animals and plants reproduction, development, and growth are effected by this multiplication by division.

As to size, microbes are very small, varying from a 500th to a 50,000th of an inch in greatest length.

They are found in the air and the water and soil. They may travel long distances by the winds and waters, and may live for a very long time. Their increase is favored by warmth, moisture, and the presence of organic matter. A bacterium may divide into two in the course of an hour ; these become four in another hour ; and at this rate of increase we will have in 24 hours from one

bacterium nearly 17,000,000 individuals. In less than five days, at the same rate, they would fill all the great waters of the earth.

It is well to remember that a microbe which begins as a micrococcus may pass through the stages of bacterium and bacillus to that of spirillum. It is said, too, though this is also doubted, that a microbe which to-day is innocent—that is, will not produce disease—may to-morrow be hurtful. The oxygen of the air under pressure is known to modify its pathogenic or disease-producing power. Pasteur says that the oxygen of the air attenuates and extinguishes the poison. This fact may explain the spontaneous cessation of epidemics.

It has already been mentioned that some microbes are innocent—do not cause disease; but they nevertheless cause changes in organic matter. These innocent ones are in by far the greatest number, and by reason of this abundance interfere somewhat with our finding the hurtful ones.

The tenacity of life of the microbe is shown by the fact that many forms may be imbedded in ice without losing their vitality. Dr. Prudden has shown that certain bacteria may be frozen for 37 days and still be alive. Dr. Dornil, of Paris, has found that ice is often a medium of transmitting typhoid fever, and says that ice from rivers or ponds is as dangerous as the water itself.

The great factor in the distribution of most infectious diseases is human intercourse. At the present day the means and rapidity of intercourse are such that the danger of infection is much greater, and an epidemic spreads more rapidly and extensively than heretofore. Of course our methods of combatting disease are so much improved by isolation, disinfection, etc., that the terrible death-rate of past ages is not repeated in the present.

Examination of air to detect the presence of microbes has often been made, and the results show that they are in greater number in summer than during the other seasons, and appear to reach a maximum in August. Again, the higher we ascend in the air, the less the number. This is true of country and city. The air of the upper parts of the houses, the roofs, etc., contains fewer microbes than of the lower parts or the streets. The denser the population, the greater the number of microbes in the air. At sea, beyond, say, 120 miles from land, the air is generally free from them, although they are abundant in the sea water. The air of sewers has been examined by Carnelly and Pétri and found remarkably

free from microbes, less, indeed, than the air outside the sewers. The explanation seems to be that in sewers there is no dust, the walls are moist, and the microbes are retained in the moisture. The liquid contents are alive with bacteria. These do not find their way into the air of the sewer unless fermentation takes place and bubbles of gas are disengaged or splashing occurs.

It may be said, in passing, that the microbes of the soil play an important part in the nutrition of the plants. They act on the soil in such a way as to cause oxidation of organic matter and ammonium, forming nitric acid, nitrates, etc., which, in solution, are absorbed by the rootlets of the plants. A gram of soil may contain as many as two millions of microbes.

River water and other surface water contain them in abundance. Waters like those of springs and deep wells, which have filtered through the soil, are in that way deprived of microbes. Filtration through finely divided coke or charcoal or sand gives the same result. Pasteur has shown that water forced through porous porcelain is entirely free from them. Filtration of river water through sand has reduced the proportion of them from 43 to 1. Water of deep wells filtered through chalk rocks shows a proportion still less.

There seems to be no reason to doubt that the same means which purifies water from harmless microbes will do the same for the hurtful ones. It is well to note that while ordinary drinking water is not a favorable medium for extensive growth of disease germs, yet, if these are in the condition of spores, they may be found quite permanently in any water, however pure.

In the process of decomposition of animal matter a class of poisonous substances is formed, called alkaloids: animal alkaloids, to distinguish them from vegetable; cadaveric alkaloids, as indicating their *post mortem* origin. They are also called *ptomains*. The presence of these ptomains explains the many cases of poisoning from eating decaying animal foods, as sausages, fish, tinned meats, ice cream, etc. Their formation is due to the action of putrefactive microbes on the albuminous substances of the dead tissue. It is probable that the microbe takes a certain amount of the carbon, hydrogen, etc., of the albuminous bodies for its own nourishment and multiplication, and the ptomains are found in the residue.

Similar poisonous alkaloids may appear in the *living* organism by a change of the protoplasm or decomposition of the albuminoids. These have been called *leucomains*. They are found in small quan-

tity in normal human urine, and increase very much in number in certain infectious diseases.

A third class of substances similar to, but more poisonous than, the ptomains and leucomains has also been found in the living body, and they have been called extractives.

The great source of danger from microbes is believed to be in their poisonous products. In typhoid fever, Asiatic cholera, septicæmia, diphtheria, and some other diseases of this kind, the microbes produce the poisonous alkaloids and spread the infection. In cholera morbus there is a poisonous base called methylguanidin. Four alkaloids have been isolated from the bacillus which causes tetanus; they are called tetanin, tetanotoxin, spasmotoxin, and the fourth not named.

Pasteur believes that hydrophobia is due to a microbe which produces an alkaloid. The microbe itself has not been identified, but a poisonous ptomain has been obtained from the brain of rabbits suffering from the disease, and this ptomain produces the characteristic symptoms.

The comma bacillus of Professor Koch, called so from its resemblance to a comma, is undoubtedly the agent in causing Asiatic cholera. Alkaloids also have been found in the dejections in this disease.

The *bacillus typhosus* is found in typhoid fever; the alkaloid, however, called typhotoxin, is believed to cause the disease.

Malignant pustule, occurring especially in cattle, is due to a microbe called *bacillus anthracis*; the ptomain is anthracin.

Some ptomains are analogous, chemically, to certain vegetable alkaloids. Again, the same species of microbes will produce different ptomains, according to the organic substance in which they live.

Ptomains which are devoid of oxygen have a strong odor like musk, etc.; this odor is so persistent that, as previously stated, Dr. Gautier recognized it in the guano of prehistoric formation.

It is said that some microbes give rise to soluble ferments called *enzymes*, products of living protoplasm. Dr. Sheridan Lea has shown that the *micrococcus ureæ* secretes a ferment which converts urea into ammonium carbonate. Drs. Roux and Yersin have obtained a soluble poison from the cultivation of the *bacillus diphtheriticus*, which produces all the symptoms of diphtheria. It is an animal alkaloid, but a special ferment. It is proper, however, to say that the bacillus itself will cause the disease. In the case of the *bacillus anthracis*, the ferment produced will not cause the disease.

Pasteur has shown that if the blood of animals suffering with anthrax is filtered free from bacilli, the blood will not then cause the disease.

Drs. Lauder Brunton, and Macfadyen have shown by experiment that the microbes which liquefy gelatine do so by means of an enzyme. The enzyme can be isolated and its peptonizing action be demonstrated, apart from the microbes which produce it. For purposes of nutrition, microbes can form ferments adapted to the soil in which they grow.

The real cause of infectious diseases is, therefore, in some cases, the microbe; in others, the alkaloid or ferment, formed or secreted by the microbe. In most cases microbes produce both poisonous alkaloids and special ferments.

A few other interesting substances produced by microbes may be mentioned. The *torula cerevisiæ* or yeast plant, acting on sugar in solution, causes a fermentation which results in the production of alcohol and a residue. This is called the alcoholic fermentation. Again, the *bacterium aceti* produces vinegar in a pure state. The *bacterium lactis* acting on the sugar in milk produces lactic acid, causing the milk to become sour. All putrefaction results from the action of numberless microbes, the most important of which is the *bacterium termo*. The *bacillus butyricus* acting on butter makes it rancid; acting on cheese, causes it to ripen. The *bacillus tuberculosis* produces cellulose in the blood and tissues of tubercular persons, but does not produce an alkaloid.

Some microbes form pigment on the material in which they live. A few only of these are associated with disease. What is called indigo blue is produced by the action of a bacillus on indican, a substance existing in the indigo plant. This indican has also been found in human urine, especially in cases of intestinal obstruction and ulceration, and in granular kidney. The blue color of sweat is due to microbes. Many of these pigment-forming microbes are found in the air and give rise to patches of color on articles of food. The red spots which sometimes appear, especially on bread, and which in old times were supposed to be blood from the finger of an angry God, are known to be composed of groups of the *micrococcus prodigiosus*. Yellow milk is due to *bacterium xanthinum*. The blue color of litmus, used in testing acidity of fluids, is from the action of putrefactive microbes.

Some microbes acting on alkaline sulphates and organic matters in water, as in certain mineral springs, cause the freeing of the sulphur and disengagement of sulphuretted hydrogen.

Many of the lower animals have the power of making themselves phosphorescent. This luminosity is accompanied by the transition of peptones into organized living matter under the influence of free oxygen. This phosphorescence appears to depend on the action of certain microbes.

Experiments have been made to determine how great a degree of heat can be endured by them without being destroyed. The following are some of the results: The bacilli of anthrax and of swine plague were destroyed after exposure for one hour to a boiling temperature. The *spores* of the bacillus, however, required an exposure of four hours to the same temperature. As it is stated that none of the infectious diseases depend on the spores, it follows that their pathogenic microbes can be destroyed at a temperature of boiling point for one hour. Steam heat will destroy them and their spores in a little over five minutes.

On the other hand, many microbes will withstand a temperature of 90° F. without losing vitality, if the air is dry. *Tubercle bacilli* after being dried for three or four months may still be alive. Other microbes have been known to endure a tropical temperature in dry air for as much as three years. This endurance of heat and dryness is comparable to that of some of the lower animals. For instance, the *anguillula* has been found alive after two years desiccation; rotifers after four years, and some eel-worms after 30 years. The ability to endure cold has already been mentioned.

The action of electricity on microbes has been very little studied. Experiments show that the electric current is detrimental, and it is known that after a thunder-storm the microbes in the air are fewer than at any other time. Light is beneficial to some, detrimental to others. The same as to gases. Microbes which require free oxygen are called *aërobic*; the others *anaërobic*; but all require oxygen in some form. Compressed oxygen diminishes or destroys their vitality.

The condition of not being susceptible to infectious disease is called immunity. It is either *natural* or *acquired*. Some microbes will produce disease in some animals and not in others. The bacilli of anthrax will cause the disease in sheep and in man, but not in cats, dogs, or pigs. The bacillus of septicæmia, or what is commonly called blood-poisoning, will produce the disease in house-mice, but not in field-mice. These are cases of natural immunity. The acquired form is shown when an animal has an infectious disease, recovers, and then for a longer or shorter time it is not sus-

ceptible to another attack. The theory is that the microbes have consumed some element in the body which is essential to their growth and development. The body is, therefore, unfit to sustain a second crop, the soil is exhausted; and until this absent condition is restored the body is protected against another seizure of the disease.

Again, this constituent may be exhausted by a microbe which is less vigorous and destructive than the one which causes the disease, and, if this is done, then the introduction of the more vigorous one will fail to find anything to grow upon, and the individual is thus protected. This is the explanation of vaccination. The *attenuated* virus is a protection against the more poisonous virus.

This theory of *exhaustion*, as it is called, does not explain all the facts in the case; and the *antidote* theory of Klebs explains them more fully. His theory supposes that the microbes produce a substance which is poisonous to themselves in case they should reënter the same person at a subsequent time. There is some direct evidence in support of this theory.

The acquired form of immunity may be subdivided into that of acclimatization and that of inoculation.

People of tropical climates are less susceptible to the malarial fevers, etc., of their country than are strangers. This is acclimatization.

Vaccination, or protective inoculation, is the introduction into the system of a milder or weaker virus than that which produces the disease. In this way it is a protective in small-pox, yellow fever, splenic fever, chicken cholera, hydrophobia, swine fever, cattle plague, acute septicæmia, etc. There is no such protection, however, in such diseases as tuberculosis, pneumonia, erysipelas, malarial fever, relapsing fever, and breakbone fever. I have included tuberculosis here because I do not think, as yet, the inoculation of tuberculin, the modified virus of tuberculosis, has been proved to be a protection against the disease. In erysipelas, pneumonia, etc., one attack of the disease, so far from being protective against another, appears to increase the susceptibility.

The proportion of deaths from small-pox in 1,000 deaths from all causes is one-twentieth now what it was before vaccination was introduced. Deaths from splenic fever are one-twenty-fourth what they were before inoculation of the attenuated virus was practiced, and in hydrophobia, one-twenty-third. Some work has been done in inoculating against diphtheria.

I must pass over the discussion of how this milder virus is obtained and say something about germicides or microbe-destroyers; also called necrophytes. Two expressions are used in this connection which need to be explained. The word *antiseptic* is used, meaning *against poison*. Anything that retards or prevents the development of a poison is antiseptic. The same substance, if used in sufficient strength, may become an actual destroyer of germs. This we call a *germicide*.

There are many chemical agents which are antiseptic and germicidal. It would be very desirable, so far as microbe diseases are concerned, to be able to introduce into an animal, its blood, etc., this destructive chemical agent. The difficulty, however, is to use such germicide in sufficient strength to destroy the microbe and yet not injure the patient. It would be the height of therapeutic success if we could inject into the blood by means of a hypodermic syringe a little appropriate fluid and so stop the progress or prevent the development of an infectious disease—say, typhoid fever—by killing the microbes; or when the disease is caused by a poisonous alkaloid or special ferment, it would be desirable to neutralize these by some chemical agent and thus abort the disease. The destruction of the microbes in the first instance would, of course, prevent the formation of the alkaloids or ferments. I mention only a few of the more prominent of these microbe-destroyers.

The salts of mercury, especially the mercuric chloride or corrosive sublimate. A solution of this salt, one part in 1,000 to 5,000 of water, will destroy the most resisting organism in a few minutes. There is a difference of opinion as to whether such solution will destroy the spores, although the weight of evidence seems to favor the opinion that it will. This salt has been and is still very extensively used in surgery, midwifery, and ophthalmia of the new-born.

Iodine is a germicide and has been used hypodermically in splenic fever. In consumption also it has been used to diminish the number of bacilli and prevent the formation of spores, though its inhalation causes irritation and cough.

Sodium chloride, common table salt, is said to destroy the comma or cholera bacilli, but the microbes of typhoid fever, tubercle, cattle plague, etc., may remain in common salt for months without losing the power of growth and reproduction. The salting of meats, therefore, may be ineffectual in preventing the development of pathogenic microbes.

Sulphuretted hydrogen destroys the bacillus tuberculosis and is

poisonous to nearly all other microbes. Dr. Bergeon and others have used this gas in consumption by injecting it per rectum. Claude Bernard has shown that gases which are poisonous when breathed may be introduced into the blood in some other way without poisoning. Bauman, a pupil of Liebig, claims to have cured consumption in the early stages by having the patients breathe in rooms in which sulphur was burning. For the first ten days the cough and irritation increased; afterwards the patients rapidly improved.

Free oxygen is germicidal to some microbes. Ozone is found especially in the high regions of the atmosphere and in sea air. Microbes are least numerous in these regions. Ozone destroys microbes, and it is supposed that it does so by decomposing organic matter and setting free the oxygen. The advantages of residence of consumptives in high altitudes, as the Swiss mountains, is partly explained in this way. Oxygenated water acts like ozone.

Air saturated with oil of turpentine is germicidal. There is a popular and seemingly well-grounded belief that the air of a country well wooded with turpentine trees is useful in preventing and curing consumption. Skoda says that moist air with turpentine vapor is useful in gangrene of the lungs.

The salts of quinine destroy both pathogenic and non-pathogenic microbes. They destroy the *bacillus malariae*. The best salt for therapeutic purposes is probably the hydrochlorate. The dose by mouth must be proportioned to the severity of the case or intensity of the poison. Stanley, in Darkest Africa, took doses of 45 to 50 grains.

The alcohols are antiseptic and germicidal; will arrest the development of microbes and spores; but the spores, once formed, are said to resist strong alcohol for months. The destruction and prevention of putrefactive germs is well shown in the use of alcohol in laboratories of anatomy, pathology, etc.

There are many other lesser germicides which I need not stop to mention. The tendency of the present day is to rely less on disinfectants and more on absolute cleanliness. If we should visit one of our best hospitals we would see the ceilings and walls painted, because it has been found that wall-papers accumulate germs and dust; the paint can be readily cleaned. There are no carpets on the floors nor woollen curtains at the windows, because of the same objection; the floors are painted, varnished, or oiled;

the windows are shaded by shutters or light curtains. Water pipes, closets, and bath tubs are exposed, so that dirt cannot accumulate nor leakage occur without being at once noticed. Gas is replaced by electricity to avoid contamination of the air by the products of combustion. Hot air from a furnace is replaced by hot-water heating, or the air is screened as it enters the building. The water used for drinking and the preparation of food is boiled to free it from possible organic substances that might be hurtful. Every other possible precaution is taken to prevent the introduction of poisonous microbes. The instruments used in operations are made entirely of metal, and can be placed, box and all, in boiling water before using, to destroy all possible germs. The operator keeps himself clean; wears overgarments of linen or some non-woolen material. The subject for operation is handled only so much as is necessary; only a limited number of assistants and spectators may be present. The effect of all this precaution has been to diminish largely the mortality; serious consequences which formerly were not unexpected would now be an opprobrium to the operator and the hospital. Speaking generally, such a place is far better for treatment of sick and injured than any private house, even that of the most wealthy.

The diseases which are known or believed to be caused by microbes, or their products, are about 40 in number. Among them are cerebro-spinal meningitis, chicken cholera, Asiatic cholera, so recently at our doors; dental caries, which is the staff of life to thousands of dentists; diphtheria, erysipelas, glanders, hydrophobia, leprosy, malaria, measles, pleuro-pneumonia, puerperal fever, pyæmia, scarlet fever, swine fever, tetanus, commonly known as lock-jaw from one of its prominent symptoms; tuberculosis, typhoid fever, small-pox, vaccine disease, and yellow fever. These diseases are most dreaded; they decimate populations, and yet are most easily prevented.

In hydrophobia or rabies there is a micrococcus, which, however, has not yet been isolated and cultivated, found in the nervous system.

In yellow fever micrococci are found in the kidneys, spleen, and liver. The disease is worse during the heated term and ceases with frost.

In erysipelas they are found in the lymphatic vessels of the skin. In small-pox, also in the lymphatics of the skin.

In pneumonia, in the sputa and blood. The disease can be produced in some of the lower animals by spraying the microbes in the animals' cages.

In whooping-cough an oval-shaped micrococcus is found, but has not yet been isolated.

In measles, micrococci are found in the skin, blood, and catarrhal exudations.

In scarlet fever, in the blood, exudations, ulcerated throat, scaling of skin, and in urine; found also in the milk of cows suffering with certain diseases of the udder.

In gangrene there are small oval micrococci.

In cattle plague, micrococci are found in blood and lymphatic glands.

In cerebro-spinal meningitis, in the pus at base of brain and in kidneys.

In puerperal fever, found in endocardium, lung, spleen, kidney, brain, etc. An alkaloid has also been found in the organs of those dead of the disease and in the urine of patients. To prevent the fever, an antiseptic treatment of the lying-in patient should be adopted.

In what is called suppuration the microbe *micrococcus pyogenes aureus* is found.

In septicæmia, micrococci and bacteria are found in great numbers.

In chicken cholera the *bacteria cholera gallinarum* is found in large numbers in the blood and organs of fowls dead of this disease. A culture injected into the blood-vessels of a chicken or rabbit develops the characteristic symptoms. Guinea pigs, however, are said to have immunity.

In diphtheria a bacillus and an enzyme are found. The bacillus is in the diphtheritic membrane, but not in the blood of diseased organs. The cat, cow, and Guinea pig are liable to the disease if inoculated with the bacillus.

In typhoid fever, the bacillus typhosus; found in Peyer's glands, spleen, larynx, lungs, liver; sometimes in kidneys and urine, and in blood. The disease has been reproduced by inoculating pure cultures. The stools of patients are highly infectious and should be disinfected before being thrown away. Mercuric chloride or ferrous sulphate may be used for this purpose.

In malaria the *bacillus malariae* is found in the spleen and marrow

in the form of threads and spores. The microbe was first discovered in the soil of the Roman Campagna. It flourishes in marshy districts, deltas, alluvial soils, and banks of tropical rivers. It is found abundantly in the blood in malarial diseases, and is said to be inhaled, but may perhaps be taken up by the skin or stomach. It is wafted by winds, floating about six feet above the ground, and is stopped by mountains and belts of trees. An amœbiform organism has also been found in the blood in this disease; if injected into the veins it gives rise to intermittent fever.

In glanders or farcy the *bacillus mallei* has been found in the lungs, liver, spleen, and nasal membranes of horses, sheep, and men dead of the disease.

In leprosy, the *bacillus lepræ*. The disease is both contagious and hereditary. If the cultures are introduced into the system of an animal they produce the disease. The disease is common in parts of Africa, South America, Southern Asia, and some of the Pacific islands. It is incurable.

In tuberculosis or consumption, the *bacillus tuberculosis* is found in sputum, blood, tissues, urine, etc., and in the tubercles themselves. Inoculated in animals, it produces the disease. The bacillus forms cellulose from the tissue. Not only man, but the cow, goat, sheep, horse, pig, carnivorous animals, fowls, and rodents are susceptible. It grows more readily in animals which are omnivorous or herbivorous. Galtier says that cheese and whey from the milk of tuberculous cows often contain the bacilli. Swine and poultry fed on these dairy products often develop the disease. Their flesh in turn may give the disease to man.

The expectorated matter of tuberculous patients is highly infectious, even after having been dry for several months. The bacilli may enter the system by breathing or swallowing, or directly by a scratch or cut. Boiling milk and thorough cooking of meats of animals suspected of having the disease destroy the bacillus. Persons suffering with the disease should sleep by themselves, for many have contracted it by occupying the same bed with a patient. All causes which weaken the constitution increase the susceptibility and hasten the progress of the disease.

In anthrax or malignant pustule or splenic fever the *bacillus anthracis* is found in blood and tissues of animals, and causes the disease. Those who handle the hides, wool, or hair of animals dead of the disease are liable to contract it, either by breathing the

spores or by a wound in the skin. The animals should be cremated. It is said that the bites of fleas can carry the infection. Animals grazing on the land previously occupied by diseased animals are liable to be infected.

In swine fever a bacillus is found in lungs, spleen, liver, intestine, and serous membranes of pigs dead of the disease. Inoculations of pure cultures produce the disease in those susceptible, as pigs, rabbits, mice, and pigeons. It may be so cultivated as to be modified. When this modified form is inoculated the animals become proof against a fatal attack.

In Asiatic cholera the *bacillus cholerae* or *comma bacillus* is always found in the rice-water stools of patients sick or dead of the disease.

In tetanus, bacilli which produce spores. These inoculated in mice and rabbits reproduce the disease.

Yellow fever spreads by means of moist winds and human intercourse. Water and soil seem to have nothing to do with it. It prevails in plains near the sea-coast and along the course of great rivers.

Cholera follows the course of rivers. A moist atmosphere and soil are necessary. Moist winds are the great agents of distribution. Troops, pilgrims, and emigrants spread the disease far and wide.

Malarial diseases are more prevalent in moist than in dry weather. Moisture in the soil is necessary to their production; clayey, loamy, marshy soils favor the development. In marshy districts the larger the amount of organic matter in the soil, the greater the amount of malaria. The lower the level of the country, the more prevalent the disease, although in Central Africa a height of 2,500 feet is not free from it. Air, water, and food may convey it.

In conclusion, I would remark that the discovery of these microbes, the study of their life history and products, and their causative and other relations to disease have done much to simplify treatment. Generally speaking, these diseases run a definite course, which can be but little, if at all, shortened by any treatment. The treatment is, therefore, directed towards making the patient comfortable, keeping up his strength, preventing complications, controlling his personal hygiene and his surroundings, and in other ways avoiding death and promoting recovery. This is the true idea of cure, which is to take care of. The mortality is much lessened; the consequences are much less serious.

GEOGRAPHIC NOMENCLATURE OF THE DISTRICT OF COLUMBIA.

A REPORT.

In considering a system of nomenclature it is essential to remember that a name may be a description or a mere label. Originally all or nearly all nouns were descriptive, conveying in concise form some idea of the distinguishing peculiarity of the thing named, so that one who had never seen the object could still know something of its nature from hearing its name. In primitive languages nouns still retain this characteristic, and can usually be resolved by analysis into their adjective and verbal elements. This is true in a less degree of the early Greek and Latin, but age has sapped the blood of our words until they have largely become mere arbitrary symbols. The change has come alike upon common nouns, zoologic and botanic names, and personal and geographic names. Without going into a detailed argument, we may assume that where individuality exists it may be expressed in the name, but where all things are alike a mere label is sufficient. The streets and alleys of a city, with their straight lines, level pavements, and rows of brick walls, are practically alike, but in the country every hill and every running brook has its own separate individuality.

Street and Alley Names.

With regard to names for streets and other city thoroughfares there is an evident advantage in having the name indicate the relative position, and the most obvious method of accomplishing this is by means of a system of nomenclature which is numeric or alphabetic or both. The numbers may run on indefinitely, but the alphabet has a limit, so that if an alphabetic system be adopted it is necessary to start a new series when the streets go beyond twenty-six.

Washington, as originally laid out, consists of four sections, with the Capitol in the center. North and South Capitol streets form the dividing line between the eastern and western portions, while East Capitol street and a theoretic West Capitol street running through the Mall separate the northern and southern portions. The

four sections, which are designated respectively as northwest, northeast, southeast, and southwest, are very unequal in extent. The original District was a tract of ten miles square on both sides of the Potomac, taken partly from Maryland and partly from Virginia. The Virginia portion, extending along the river from the Chain bridge to Alexandria, was afterward retroceded, thus cutting off about one-fourth this area. As originally planned, the site of the Washington monument was the center of the District, whereas by this change it is now on its southwestern limit, the Potomac river. The streets within the city are laid out at right angles, crossed by avenues running diagonally; and, by a recent ruling of Congress, as the city grows these streets must be extended upon the same lines, wherever possible, to the limits of the District. Therefore, whatever system of street nomenclature is adopted within the city must be one that can be adapted without change to the requirements of its future growth as here indicated. Briefly stated, it is possible for the future city of Washington, according to the present delimitations of the District, to extend from six to seven miles north, east, and west from the Capitol. The southwest is cut off by the river and can expand no farther, while the southeast, including Anacostia, is capable of a limited expansion toward the south.

Under the present system the streets are numbered east and west from the Capitol and lettered north and south from the same starting point, while the diagonal avenues are named from states of the Union. Thus we have two series of numbered streets—First street east and First street west, etc., and two series of lettered streets—A street north and A street south, etc. It is necessary always to specify the section as well as the street—as 215 D street northwest—which is a disadvantage, but is rendered necessary by the quadruple plan of the city. On the whole, the system is simple and convenient, besides giving opportunity for future growth, and the problem now before the District Commissioners is how to extend it to the new streets to be laid out beyond the present city limits.

The numbered streets run out to Twenty-third east and to Thirty-seventh west (in Georgetown), and as future parallel streets can be numbered onward consecutively we may consider the numbered streets provided for. In this series, however, we find a few short streets, running each only two or three squares and called by fractional names to indicate their relative position, as Four-and-a-half street, Thirteen-and-a-half street.

The system of naming the diagonal avenues after States of the Union is entirely satisfactory, and as there are a sufficient number of States to furnish names for all future avenues we may also dismiss the avenue question. As the avenues intersect at all angles, there can be no rule by which the name shall indicate the position. It might be better if Florida avenue were divided at Seventh street, making two avenues under different names instead of one as at present, at the same time straightening the western portion as far as practicable toward Seventh street at one end and Massachusetts avenue extended at the other, so that this portion might be approximately parallel with New York and Rhode Island avenues, while the eastern portion would be approximately parallel with Massachusetts, Pennsylvania, and Virginia avenues.

We come now to the most difficult problem in street nomenclature—the naming of the present (lettered) streets running east and west and of future streets to be laid out parallel with them. Before going into this matter let us define the various classes of streets as recognized or contemplated by the Commissioners.

In the first place, the broad thoroughfares running diagonally through the city are called *avenues*. Next, the thoroughfares crossing each other at regular intervals in either direction are called *streets*. Then we have shorter streets, running perhaps for a square or two, midway between the longer streets of the regular series. Some of these are at present called streets, as “Corcoran street;” others are known as places, as “Grant place.” It is proposed by the District Commissioners to distinguish all these as *places*, giving to them at the same time such names as will indicate their position with relation to the regular lettered series. The present “Grant place” is a good illustration of the proposed method. The title *place* indicates that it is a short street intermediate between two of the regular series, while the name *Grant*, beginning with G, shows that it is next to G street. The short streets in the numbered series would take fractional names, as Four-and-a-half street, Thirteen-and-a-half street, or might better be called “places,” to agree with the nomenclature of the short streets in the lettered series, and could be designated by numbers corresponding with those of the streets next following—*e. g.*, Fifth place, Fourteenth place, etc. We have still a fourth class of inhabited city thoroughfares, viz., alleys, which by the growth of population have come to be tenanted by families of the poorer class and are now practically smaller streets. Many of them

are now well paved and built up with good houses. It is proposed to designate these as *courts*, reserving the name *alley* for the smaller thoroughfares, which are used as passages but not for residences. In the renaming, most of these courts will become places, so that the choice of names for the few remaining will be a simple matter. It should be noted that when two or more places are on the same line, even though the continuity is broken by intervening solid squares, they will be called by the same name. Within the present city limits the initial letter of a "place" would naturally be the same as the letter constituting the name of the regular street immediately following it. Future streets should be laid out at such convenient intervals as to render shorter "places" unnecessary. Uninhabited alleys can be designated by means of the nearest streets. The poor will thus be relieved of the necessity of considering themselves as mere alley refuse, and we shall be rid of the abominable names which now disgrace our city directory, and which are derogatory to the dignity of manhood, for though good may come out of Nazareth, it is hard to imagine it as coming out of Bedbug alley.

On August 27, 1888, Congress approved "An act to regulate the subdivision of land within the District of Columbia." The most important section of this bill is section 5, which provides that "No future subdivision of land in the District of Columbia, without the limits of the cities of Washington and Georgetown, shall be recorded in the surveyor's office of the said District unless made in conformity with the general plan of the city of Washington." As a result of this the District Commissioners, on December 6, 1888, issued a series of "General Orders" in regard to streets and subdivisions in the District. These orders embody the fruits of careful study of the question by practical men familiar with the requirements of the case and the difficulties to be overcome. The sections which bear most upon the point at issue are as follows :

7. No subdivision of land outside the cities of Washington and Georgetown will be approved unless the streets and avenues therein conform as far as practicable in width and general direction to the same streets and avenues in the city of Washington.

8. Whenever practicable, streets and avenues will be in exact alignment with the streets and avenues of the city of Washington and of equal width.

20. The names of all avenues, streets, circles, and public spaces will be subject to the approval of the Commissioners.

21. The following scheme for naming these will be adhered to :

22. The broad diagonal highways will be designated as avenues and will be named after the States of the Union.

23. Streets running north and south will be numbered each way from the meridian of the Capitol. If the streets are not direct continuations of the city streets, their names will correspond with the city streets most nearly due north or south of them.

24. Streets running east and west will be named from the letters of the alphabet until these letters are exhausted. Beyond this they will be named after the principal cities of America, the names of which commence with the letters of the alphabet in their proper order of rotation, as Albany street, Baltimore street, Chicago street, Detroit street, etc., etc. When the alphabet is thus exhausted the succeeding streets will be named for the principal rivers and lakes of America, the names of which commence with the letters of the alphabet in proper rotation, as Albemarle street, Brazos street, Champlain street, Des Moines street, etc.

25. Streets not in exact alignment with those to the east or west of them will take the names of those streets most nearly in the line of their direct continuation.

26. Small streets which do not form an essential part of the rectangular system of streets will be designated as "places," and will receive such names as may be approved by the Commissioners.

27. No two streets, avenues, or places in the District of Columbia shall have the same name.

28. Circles and other public spaces will be named after distinguished Americans who have been prominent in the service of their country.

We have here provision for three alphabetic series of street names, viz., letters, American cities, and American lakes and rivers, sufficient to furnish names for possible streets as far out to the north as a line drawn west from Takoma Park station, leaving about ten or twelve possible streets beyond unprovided for. The lettered streets as now existing end with W, at Florida avenue, omitting J, which is discarded on account of its resemblance in manuscript to I. The letter series, however, although of long standing, has many enemies on account of its baldness. One writer, in a letter to the Commissioners on this subject, refers to it as "utilitarianism run mad."

As far back as 1886 a bill had been introduced into the Senate proposing to substitute for letters two alphabetic series of names of distinguished Americans, taking for the north the names of statesmen and for the south the names of commanders in the army or navy. Thus, for A, B, C, and D streets it was proposed to substitute Adams, Benton, Clay, and Douglas streets.

More recently a plan was proposed for distinguishing the lettered streets south by names of women. The list started off very well

with Bertha, Diana, and Florence, but when it got down to Kathleen, Ophelia, Priscilla, and Sophia the originators of the scheme fled in horror from the thing they had created.

Still another plan, now under contemplation, is to use letters only to designate the short "place" streets already referred to, having the letter in each case to correspond with the initial of the name of the parallel street immediately preceding it,* and to use for all other streets running east and west different series of alphabetical names sufficient to furnish names for all such possible streets to the bounds of the District. It is proposed to stop at W, the remaining letters being difficult to handle, and to have distinct series north and south of the central line of the city. This would necessitate seven alphabetic series or parts of series of names, four north and three south, of which it is contemplated that the first, north, shall consist of the names of distinguished Americans, to take the place of the present letter names; the second to be names of American cities, the third American rivers and lakes, the fourth or partial series unprovided for. For the letter names south the scheme contemplates, first, a series of tree and plant names instead of the present letter names, to be followed by another series and a fractional series unprovided for to extend to the southernmost corner of the District.

It is claimed that this arrangement would discriminate at once between north and south, and thus obviate the need of the N. or S. in letter addresses, while it would also show how far from the center any point might be located. The objections to it, however, are fatal. We cannot get rid of the E. and W. in letter addresses, and experience has shown that there is greater liability to forgetfulness where only one letter is used than when two must be considered. There is no good reason why we should have different series north and south when we have only one system of numbers east and west, and are consequently obliged to take the sectional abbreviation constantly into our calculation.

It is practically impossible to formulate seven alphabetic series of names that shall be entirely distinct and otherwise satisfactory and not be forced and ridiculous in places on account of the very limitations of the case. Certain letters do not fit well in alphabetic series,

* It would be preferable to designate places by the names of the next *following* streets in order to avoid the difficulty of naming the places below A and First streets.

while for certain other letters there are always a number of candidates equally worthy of a place. This is especially true of any alphabetic series of "distinguished Americans." Under certain letters there is a redundancy of candidates, all equally deserving of commemoration, while under other letters it is impossible to find names, excepting those of persons so obscure as to be practically unknown. It is absurd to commemorate a man simply because his name chances to begin with a K or a V. The circle and other park monuments are the proper mediums by which to commemorate our great men, and this distinction should be reserved for those who are really great, and as there is always a wide diversity of opinion in such matters, the honors should be awarded only by a national legislative body. We may suggest that men who have enriched our country by their writings, explorations, and inventions as much deserve monumental honors as our generals and politicians.

A modification of the "distinguished American" plan proposed was to have four such series, one for each section, so that the name should indicate the section without the addition of a suffix. To accomplish this it was intended to have one series consist of names of military commanders, another of naval commanders, a third of statesmen, and a fourth of authors, inventors, etc. The objection to this is that it assumes for our entire population, including those of foreign birth, a knowledge of American biography possessed by few even of our educated citizens.

As the sectional system of street distinction entails certain unavoidable difficulties, it may be asked why it is not better to get rid of it entirely by numbering the streets in a single concentric series from east to west of the District, and using some different series in the other direction in regular succession from one boundary to the other, instead of making every series start from the Capitol as a central point? The answer to this is that we must make provision for the possibility, and even probability, that at no very distant period the Federal city will cover not only the whole of the present District, but a great part of the adjoining territory. Artificial boundaries cannot confine the growth of a great city, still less of a national capital, and we may look forward to the day when the numerous suburban villages springing up all around Washington will form parts of one great whole under Federal jurisdiction. A system of street nomenclature which makes the Capitol the starting-point is the only one adapted to meet the possibilities of such future

growth in every direction. Whenever the time comes to readjust the District boundaries the lines should coincide with the direction of the cardinal points, which is not the case at present.

Another proposition is to discard the alphabetic system entirely and use a numeral system instead, calling the streets running north and south First street, Second street, etc., as at present, and calling those at right angles with them First avenue, Second avenue, etc., to the limits of the District. This plan possesses the merit of extreme simplicity, and enables the stranger at once to ascertain his distance from a given point, which he cannot do under a system made up of several alphabetic series without knowing the order of the several series and making an intricate calculation in addition. For instance, he would know that the distance from Fourth avenue to Fortieth avenue was 36 squares north or south just as certainly and readily as he would know that from Fourth street to Fortieth street was 36 squares east or west, whereas to know how far Maple street might be from Atlanta street he would have to know the proper arrangement of the alphabetic *city*, *river*, and *tree* series, and then perform an intricate operation in subtraction and addition upon the three series to get the distance. This plan overcomes the practical difficulties in the way of inventing and arranging alphabetic series—difficulties which increase with each successive series demanded—and is capable of unlimited extension without change to accommodate any future growth of the city. It is in practical operation to a limited extent in the great commercial city of New York. The liability to confusion between the numbered streets and the numbered avenues is not as great as the liability to confusion under four or more different alphabetic systems. The State names applied to the diagonal avenues sufficiently indicate their distinctive character.

The committee would suggest the retention of the present system of duplicate numbered streets running north and south and of the present existing duplicate lettered streets running east and west, and that all streets running parallel with the present lettered streets be known in future as numbered avenues, beginning with First avenue and continuing in regular succession. Possibly it might be wiser to begin with Twenty-third avenue, in order to more readily extend the system of the present lettered streets, should such a course ever seem desirable.

It would be unwise to lengthen the names of the present lettered

streets. Besides the confusion which such a wholesale change would necessarily entail for a long time, the present simple letter names are the shortest that can be devised, and any other series would require a constant additional expenditure of valuable time in addressing letters and indicating locations. The difference to a business man between writing a single letter of the alphabet and writing a whole word of eight or ten letters every time he has occasion to address a correspondent is something considerable in a few days or a week, and when we extend this difference to a whole city, with its population of a quarter of a million, it becomes enormous.

If the adoption of a system of numbered avenues beyond a parallel with the present lettered streets should appear impracticable, the committee would suggest as an alternative duplicate alphabetic series of names for such streets running east and west beyond W street, the first series to consist of names of American cities, the second of American rivers, lakes, etc., and the third (partial series) of names of trees and plants. This is sufficient to furnish names for all such future streets to the present limits of the District, and the system may be extended if circumstances in time to come should demand it. The duplicate system conforms to the present method in use for both numbered and lettered streets, and abbreviates the necessity for too great multiplicity of series. In a system of city nomenclature based upon the alphabet there is a logical reason in beginning with the alphabet itself and proceeding successively to cities, next to natural geographic features, and then to natural productions.

We may now consider the essential requisites of the names to be selected. The chief requirement is that they shall be such as can be readily pronounced, or written upon a letter address, without unnecessary labor or loss of time or liability to error; therefore they should be smooth sounding, reasonably short, and the spelling should indicate the pronunciation according to the ordinary rules of English orthography. This last proviso would bar out such names as Agassiz, Des Moines, and l'Enfant, however much we might desire to commemorate the originals. Double names, such as New Orleans or St. Clair, are also to be avoided. K, N, Z, and U are always difficult letters to fill in an alphabetic series, and consequently there is little room for choice where they are concerned.

The following lists of names are submitted for the several series proposed :

First Series.—Letters of the Alphabet.

The present system of letters of the alphabet from A to W, omitting J, to remain unchanged.

Second Series.—American Cities.

In 1889 the following series of city names was prepared in the Engineer Department of the District Office :

Albany.	Joliet.	Savannah.
Baltimore.	Keokuk.	Trenton.
Cincinnati.	Lowell.	Utica.
Detroit.	Milwaukee.	Vallejo.
Emporia.	Newark.	Wilmington.
Frankfort.	Omaha.	Xenia.
Galveston.	Philadelphia.	Yuma.
Hartford.	Quincy.	Zanesville.
Indianapolis.	Richmond.	

To this list, which runs out to the end of the alphabet, there are several objections. Cincinnati, Indianapolis, and Philadelphia are too long, Newark is too nearly like New York, and Savannah is the name of a river as well as of a city. Lowell and Quincy are liable to be confounded with any series of "distinguished Americans" that might be adopted. The long sound of U in Utica is objectionable on account of its resemblance to *Yu*, and Vallejo is liable to mispronunciation.

For this series we would suggest the following :

Atlanta or Albany.	Iola or Iuka.	Quebec.
Baltimore.	Joliet.	Richmond.
Charleston or Chester.	Kingston.	Salem or Springfield.
Detroit.	Lansing or Louisville.	Toledo or Topeka.
Emporia.	Monterey or Montreal.	Urbana.
Frankfort.	Newport or Nashville.	Vandalia or Vicksburg.
Galena or Galveston.	Oakland or Omaha.	Wilmington.
Hartford.	Portland.	

Third Series.—American Rivers, etc.

Albemarle.	Itasca.	Roanoke.
Biloxi.	Juniata.	Sciota or Santee.
Chesapeake.	Kennebec.	Tahoe or Tallapoosa.
Dolores (in Colorado, 250 miles long).	Lehigh.	Ungara (in Labrador) or Umatilla.
Erie.	Miami.	Vermilion.
Fresno.	Niagara.	Wabash.
Gasconade.	Ontario.	
Huron.	Potomac.	
	Quinebaug.	

Fourth Series.—Trees and Plants.

Azalea or Aspen.	Grape or Goldenrod.	Maple or Magnolia.
Buckeye or Beech.	Holly or Hazel.	Nopal.
Chestnut.	Ivy.	Oak or Olive.
Dahlia or Dogwood.	Juniper.	Poplar or Pine.
Elm or Elder.	Kalmia.	
Fern.	Laurel or Linden.	

As these are sufficient to name all the streets of this series, the list need not be carried farther.

Circles.

In addition to the existing circles at the intersections of avenues within or adjacent to the present city boundaries it is intended to have similar small reservations, of circular, elliptical, or other convenient shape, at the intersections of all avenues to be laid out within the District in the future, and also at the points where the avenues shall meet the future avenue or boulevard which is intended to form the boundary of the District on its three land sides. It is intended that each of these small reservations shall ultimately be the site of a monument erected in honor of some distinguished American, as is already the case with many of the existing circles. These reservations will naturally be known by the names of the personages commemorated by the monuments erected upon them, in continuance of the existing custom. As state names are reserved for avenues, the name of Iowa circle should be changed to conform to the regular plan of circle nomenclature.

Bridges.

There is no reason why the name of the Aqueduct bridge should be changed, as has been urged, to Free bridge. The present name is the more euphonious as well as the more distinctive, for all bridges within the District are, or should be, free. The Long bridge must always remain as it has always been, distinctively the long bridge. In other cases bridges should be named from the roads of which they are a part or the streams which they span. In naming bridges over small streams within the parks, a bridge across Cascade run or Ivy brook might appropriately be called Cascade bridge or Ivy bridge instead of Cascade Run bridge or Ivy Brook bridge, and so on.

Suburban Roads and Villages.

It is unnecessary to plan an elaborate system of names for the suburban villages and roads of the District, as with the growth of the city the villages will be absorbed, while most of the roads will be made to conform more nearly to established city thoroughfares, the names of which they will then assume, or will be wiped out altogether. In the meantime, a few suggestions are in order.

Regular thoroughfares outside of cities are commonly known as turnpikes or pikes, roads, and lanes. A turnpike or pike is simply a road along which at intervals are erected turnpike gates at which toll is collected for the privilege of passing over the road. The term lane implies something more hemmed in and narrower than the ordinary road, and in this sense is frequently used to denote a passageway leading up from the main road to a country residence. There is a pleasant suggestion of fresh flowers and green hedge-rows in the name that renders it peculiarly appropriate for use in connection with a number of driveways that may hereafter be laid out in the Zoological or Rock Creek park. The smaller park roadways, too narrow to permit the passage of vehicles, may appropriately be designated as paths or walks, both names alike having an agreeable woodland flavor.

Pikes and other country roads are usually known by the names of the principal towns, streams, or other features along their lines, as the Bladensburg road, Broadbranch road, Piercemill road, etc. Many of our District roads, following the old colonial fashion, take their names from the early proprietors of the estates through which they ran, as the Carroll road, the Blair road, and so on. Theoretically the name of a road should indicate its objective point or general direction, but this is not often practicable within the District, owing to the irregular configuration of the surface.

Road names, like those of streets, should be reasonably short and not liable to mispronunciation or apprehension, and to avoid redundancy those roads which are approximately continuous along the same line should have the same name. In accord with this idea several changes might be made with advantage.

Loughboro road.—This name is liable both to mispronunciation and misreading. On one map it appears as Longboro. The name does not indicate the terminus or direction of the road and should

be discarded and the road considered a part of the Ridge road or of the other of which it is a continuation.

Foxall road.—This is another name for the Ridge road (west). On one map it appears as Fox Hall. Two names are unnecessary. It would be better to restrict the name Foxhall to the part below the New-Cut road.

New-Cut road.—Compound names are objectionable. It would be better, if possible, to select a simple name which would not suggest a time period.

Woodley-Lane road.—The name is tautologic. To conform to the general system, it should be called Woodley road.

Quarry road.—This road was so called from the former quarry at its terminus on Rock creek. As it is now the main thoroughfare to the Zoological park, it might appropriately be called the Park road.

Linnean-Hill road should be abbreviated to Linnean road.

Military road.—There are two roads of this name, a fact which sometimes leads to confusion. Some other name should be given to one of the two.

Rock-Creek-Ford road.—This road is practically abandoned and the name should be dropped from the maps.

Rock-Creek-Church road.—This name is too long, besides being liable to be confounded with that of the obsolete road last mentioned. As the old church from which it takes its name has now no apparent connection with the creek, it would be better to call this simply the Church road.

Fourteenth-Street road.—As this road bends around until it runs into Seventh street at Brightwood, the name is inappropriate. Beyond Brightwood its most direct continuation is the Piney-Branch road, which as at present defined is entirely cut off from Piney branch, while "Fourteenth-Street road" crosses this stream. It would be better to consider both as constituting one road under an appropriate name beyond the bend from the direct line of Fourteenth street. The name Piney road is suggested.

Brightwood avenue.—If this road is to be considered a continuation of Seventh street, it should be called Seventh street or, for the present, Seventh-street road. If it is to be an avenue it should be named from a state, in accordance with the general plan.

Columbia road.—This is now practically within the city and should be called either an avenue or a street, with a name to accord with the general plan. The present name is, moreover, a duplication, having also been sometimes applied to the Bladensburg road.

Bladensburg road.—As just stated, this has also been called Columbia road and is so marked on some maps. The first name is better for several reasons and should be officially adopted.

Queen's Chapel road.—This name would be better as one word without the apostrophe.

Ridge road (east).—This name, applied to a road east of Anacostia river, is a duplication of a name given to another west of Georgetown. To avoid confusion, one of them should be given a different name.

Eastern Branch or Anacostia road—should be simply Anacostia road.

Columbia boulevard.—This would seem the most appropriate name for the future grand avenue or boulevard to form the boundary of the District of Columbia on the three land sides, leaving the Potomac as the boundary on the fourth. It is to be supposed that the character of the road will justify the use of the term boulevard.

Streams, Elevations, and Country Seats.

Streams (natural) are variously designated as rivers, creeks, branches, forks, runs, or brooks, according to size or local habits of nomenclature. A river is commonly understood to be a stream of the largest size, and a brook one of the smallest, while creeks, branches, or runs are understood to occupy intermediate positions. There is, however, no fixed line of demarcation, and the use of the terms is largely indiscriminate and varies according to locality. In the West a creek may be defined as a stream of the second class—*i. e.*, a stream somewhat smaller than what would be known as a river in the same neighborhood—while in tide-water Maryland and Virginia the term is commonly used to denote a tidal estuary. In the West also the term branch is but seldom used, creek or fork taking its place, while the term run is practically unknown.

When names are made official, however, there should be a system. The Potomac is universally recognized as a *river*, and the stream formerly called the Eastern branch is now also officially designated

as a river, the Anacostia. The more important tributaries of these rivers may be designated as creeks; lesser tributaries and the principal tributaries of creeks may be called branches, and streams of the smallest size may be distinguished as runs or brooks. Thus we have *river, creek, branch, and run or brook* as designations for four classes of streams, from the largest to the smallest, that need be indicated upon an ordinary map. For illustration, a brook flows into Piney branch, which in turn flows into a larger stream, Rock creek, and this flows into the largest stream, the Potomac river.

A few of the streams within the District have recognized names which may well stand, only making the designation conform to the system indicated, where this is not already the case. A number of others have been named by Prof. Lester F. Ward in accordance with their botanic or physical characteristics, and some of these names appear on a map printed with his work on the District flora, published by the Smithsonian Institution in 1881. Many of them are in every way appropriate and may well be adopted. For other streams names may be selected from the lists herewith appended. It might be well also to commemorate in this manner some of the early explorers of the region when the names are sufficiently distinctive.

A few prominent ridges and other elevations should have names, but it is unnecessary to go very far in this direction, in view of the probability that with the extension of the city streets nearly "every valley shall be filled and every mountain made low." Every hill formerly crowned by a fort should be called by the name of that fort, if the hill itself is to remain, as Stevenson hill, Bunker hill, etc., and the historic fact should be further commemorated by an inexpensive monument. Many names will be suggested by the particular characteristics of the place. For the rest selections may be made from the appended lists.

Villa sites will be named according to the tastes of their owners, and this part of the subject is hardly a matter for official notice. In most cases the good sense and refinement of this class of proprietors may safely be trusted to work out pleasing results. To those in need of suggestions the appended lists offer a wide range for selection.

A few miscellaneous local features, such as springs, ponds, level stretches and bends in streams, will need names, especially within the Zoological and Rock Creek parks. We have nothing within the District which can be called a lake, but custom has made the term appropriate for artificial ponds in public parks. The word is

also euphonious on account of the liquid *l*. For such small bodies of water the terms *lake* or *pond* may be used. *Cliff*, *bluff* and *promontory*, *cascade* and *falls* are all appropriate in their places. *Grove*, for small bodies of timber in parks, etc., is better than forest or wood.

In every case the geographic name should be euphonious, and not too long, and where it has a meaning the idea conveyed should be pleasant and appropriate. To be most euphonious a name should consist of a regular succession of vowel and consonant or liquid sounds without redundancy or awkward combinations of either; the elemental sounds themselves should be euphonious, and in words of more than two syllables the accent, as a rule, should fall on the last syllable or the penult. The liquids *l*, *n*, and *r* tend always to euphonic effect. Botanic and biologic terms from the Latin and Greek are almost always euphonious and may appropriately be used when not too long. The Powhatan language, formerly spoken by the aborigines of the District and adjacent territory, abounds in musical terms combining the sonorous character of the northern languages with the soft vocalic syllables of the south. Rappahannock, Susquehanna, Potomac, Chesapeake, Roanoke, Powhatan, tomahawk, and moccasin are all from this language and show the character of its phonology. Philologic, ethnologic, and antiquarian considerations demand that we should preserve what remains of the names and language of our aborigines, and there can be no more practical way of accomplishing this result than by conferring these names, whenever appropriate, upon the streams and hills within their ancient domain. Names indicating the fauna and flora of the District are also peculiarly appropriate, either in the scientific or the popular form, as well as names based upon geologic features, etc., as Mitella run, Mistletoe valley, Snowbird spring, Firefly ridge, Mica bluff, etc. It would be obviously out of place to use the names of plants or animals not native to the District, or the names of the larger animals, which have been so long extinct in this region as to be practically foreign to it. A number of appropriate names will also be suggested by the picturesque character of the country. A few old homestead names from across the water may be retained on account of their antiquarian associations, but as far as possible the District names should be distinctively local and American. Family names for natural geographic nomenclature should be tabooed entirely.

Selected Names from Ward's Nomenclature of the Rock Creek Region.

- Rocket run.**—Entering Rock creek from the west a short distance above Oak Hill cemetery. So named from the abundance along its banks of the rocket plant (*Hesperis matronalis*), rare elsewhere in the District.
- Conopholis ridge.**—A high ridge between two streams entering the creek on the same side a little farther up. So named from the abundance of the *Conopholis Americana*. The English names of the plant, cancer root and squaw root, are obviously inappropriate.
- Aralia run.**—Farther up on the north side of the creek. From the *Aralia spinosa* or Hercules club found growing here and almost no place elsewhere in the District.
- Mitella run.**—Entering the creek from the north not far below Woodley Lane bridge. From the abundance of *Mitella diphylla* or Bishop's Cap.
- Checkerberry bluff.**—On the northwest bank of Rock creek, at the great bend near the Holt house and the present headquarters of the Zoological park. So named from the presence there of the *Gaultheria procumbens* or checkerberry.
- Mistletoe valley.**—The ravine through which runs the Quarry road, which leads to the principal entrance of the Zoological park. So called from the occurrence of the mistletoe on several of the sour-gum trees growing in it, especially on its southern slope.
- Violet ridge.**—The gravelly ridge between the two branches of the small stream which enters Rock creek from the east near the entrance to the Zoological park. So named from the abundance upon it of the *Viola pedata* or birdfoot violet.
- Valerian bluff.**—On north side of the creek, near the upper end of the Zoological park. From the abundance here of the *Polemonium reptans* or Greek valerian.
- Cascade run.**—"Here the Zoological park ends and the Rock Creek park begins, and the fine stream that comes in from the west is my Cascade run, so named from the cascade that it has formed. This is one of the finest natural cataracts in the Rock creek region."
- Poplar bottom.**—On the left bank, in the bend just below Pierce's mill.
- Soapstone run.**—A tributary of Broad branch. "From the well-known soapstone quarry" near its head.
- Wintergreen ridge.**—A ridge or promontory on the north bank of Rock creek near Blagden's mill. From the abundance there of the wintergreen or checkerberry, *Gaultheria procumbens*.

NAMES FROM THE DISTRICT FLORA.

(For convenience the popular and scientific names are arranged in one alphabetic series.)

Acanthus.	Bellwort.	Cassia.
Acorns.	Bergamot.	Castanea.
Adiantum.	Betula.	Catalpa.
Alchemilla.	Bindweed.	Catchfly.
Alder.	Birch.	Catnip.
Aletris.	Bittersweet.	Cattail.
Alisma.	Bitterweed.	Cedar.
Allium.	Blackberry.	Celandine.
Alnus.	Bloodroot.	Celastrus.
Amaranth.	Blueberry.	Centaurea.
Amaryllis.	Bluet.	Cerastium.
Ambrosia.	Boneset.	Charlock.
Anacharis.	Boxelder.	Checkerberry.
Andrea.	Bracken.	Cherry.
Andromeda.	Brake.	Chervil.
Anemone.	Brasenia.	Chestnut.
Anomodon.	Brassica.	Chickory.
Anthemis.	Bromus.	Chickweed.
Aphyllon.	Brookweed.	Chinquapin (aboriginal).
Apricot.	Bruchia.	Chokeberry.
Arabis.	Brunella.	Chokecherry.
Aralia.	Buckthorn.	Chondrilla.
Arbutus.	Bulrush.	Circea.
Arenaria.	Burdock.	Claytonia.
Arethusa.	Burnet.	Clearweed.
Arisema.	Buttercup.	Clematis.
Asarum.	Butternut.	Clitoria.
Asclepias.	Buttonwood.	Clover.
Asimina.	Cacalia.	Columbine.
Aspen.	Calamintha.	Comandra.
Asphodel.	Calamus.	Conopholis.
Aspidium.	Calla.	Convulvulus.
Aster.	Camelina.	Coralroot.
Azalea.	Campanula.	Coreopsis.
Baptisia.	Campion.	Cornel.
Barberry.	Cannabis.	Corydalis.
Basil.	Capsella.	Corylus.
Basswood.	Cardamine.	Cowslip.
Bayberry.	Cardinal (Cardinalis).	Crabapple.
Beech.	Carpinus.	Cranesbil.
Bellflower.	Carya.	Cratagus.

Cress.	Euphorbia.	Hemp.
Crotalaria.	Evergreen.	Hepatica.
Crowfoot.	Everlasting.	Heracleum.
Cryptogam.	Fedia.	Herpestis.
Cunila.	Fern.	Hesperis.
Cuphea.	Festuca.	Hibiscus.
Currant.	Filago.	Hickory.
Cuscuta.	Filbert.	Holcus.
Cynthia.	Fireweed.	Holly.
Dactylis.	Flax.	Honeysuckle.
Dandelion.	Fleabane.	Hop.
Danthonia.	Floral.	Hornbeam.
Darnel.	Flower, Flowery.	Horsemint.
Datura.	Fontinalis.	Houstonia.
Dayflower.	Forgetmenot.	Huckleberry.
Deerberry.	Foxgrape.	Hydrangea.
Delphinium.	Fragaria.	Hypericum.
Dentaria.	Fraseria.	Ilex.
Desmodium.	Frostweed.	Indigo.
Dewberry.	Funaria.	Iris.
Dianthus.	Galingale.	Ironweed.
Dicentra.	Galium.	Ironwood.
Dicranum.	Gaultheria.	Isanthus.
Diodia.	Gaura.	Itea.
Dirca.	Gentian.	Juncus.
Dock.	Geranium.	Juniper.
Dogbane.	Gerardia.	Kalmia.
Dogrose.	Gillenia.	Lactuca.
Dogwood.	Ginseng.	Lamium.
Drosera.	Glyceria.	Laportea.
Duckweed.	Goldenrod.	Larkspur.
Dulichium.	Gooseberry.	Lathyrus.
Eatonia.	Grape.	Laurel.
Echium.	Gratiola.	Leafcup.
Eclipta.	Greenbrier.	Lechea.
Elder.	Gum tree.	Leek.
Eleusine.	Hackberry.	Lemna.
Ellisia.	Hawkweed.	Leonurus.
Elm.	Hawthorn.	Leptodon.
Elymus.	Hazel.	Leskea.
Epigea.	Hedeoma.	Lespedeza.
Equisetum.	Helenium.	Liatria.
Erianthus.	Helianthus.	Lily.
Erigenia.	Heliopsis.	Linaria.
Erodium.	Heliotrope.	Linden.
Eryngo.	Hemlock.	Lindera.

Liparis.	Nightshade.	Pondweed.
Liverwort.	Nitella.	Poplar.
Lobelia.	Nymphaea.	Poppy.
Locust.	Nyssa.	Portulaca.
Lupinus.	Oak.	Postoak.
Lycium.	Obolaria.	Poterium.
Lycopus.	Onoclea.	Puccoon (aboriginal).
Maclura.	Orchis.	Pyrola.
Magnolia.	Orontium.	Radula.
Maidenhair.	Osmunda.	Ragweed.
Mallow.	Ostrya.	Ranunculus.
Malva.	Oxalis.	Raphanus.
Mandrake.	Panicum.	Raspberry.
Maple.	Pansy.	Rattlebox.
Mariscus.	Papaw.	Redbud.
Maruta.	Pardanthus.	Redroot.
Mayapple.	Parsley.	Rhododendron.
Meadowsweet.	Partridgeberry.	Ricinus.
Medeola.	Pastinaca.	Robinia.
Melanthium.	Pellea.	Rochelia.
Melastoma.	Peltandra.	Rockbrake.
Melica.	Penthorum.	Rocket.
Melissa.	Peppergrass.	Rose.
Mentha.	Peppermint.	Ruel.
Mertensia.	Perilla.	Ruellia.
Milfoil.	Periwinkle.	Rush.
Mint.	Persea.	Sage.
Mistletoe.	Persimmon (aboriginal).	Salsola.
Mitchella.	Phacelia.	Salvia.
Mitella.	Phalaris.	Samolus.
Monarda.	Phaseolus.	Sandwort.
Moonseed.	Physalis.	Sanicle.
Moosewood.	Pilea.	Sanicula.
Morning-glory.	Pimpernel.	Saponaria.
Moss, Mossy.	Pine.	Sassafras.
Mulberry.	Pink.	Scapania.
Mullein.	Pinoak.	Scleria.
Mustard.	Pinweed.	Scutellaria.
Myrica.	Pirus.	Sedge.
Myrtle.	Plantago.	Senna.
Nasturtium.	Plantain.	Service.
Negundo.	Platanus.	Setaria.
Nepeta.	Plum.	Shellbark (hickory).
Nesaea.	Polemonium.	Silkweed.
Nettle.	Polymnia.	Silphium.
Nicandra.	Pondlily.	Smilax.

Snakeroot.	Tephrosia.	<i>Vernal.</i>
Snowberry.	Thalictrum.	Vernonia.
Soapberry.	Thelia.	Veronica.
Solanum.	Thistle.	Vervain.
Solidago.	Thorn, Thorny.	Viburnum.
Sorrel.	Thornapple.	Vinca.
Spartina.	Tilia.	Vine, Viny.
Spearmint.	Tipularia.	Viola.
Speedwell.	Tricuspis.	Violet.
Spergula.	Trifolium.	Walnut.
Spicewood.	Trillium.	Watercress.
Spruce.	Trisetum.	Waterleaf.
Stellaria.	Trumpetvine.	Waterlily.
Stramonium.	Tulip.	Watershield.
Strawberry.	Tupelo (aboriginal,	Waxweed.
Sumac.	southern).	Willow.
Sundew.	Turkscap.	Windflower.
Sundrop.	Twingleaf.	Winterberry.
Sunflower.	Uniola.	Wintergreen.
Sweetwilliam.	Valerian.	Witchhazel.
Sycamore.	Velvetleaf.	Woodbine.
Tansy.	Veratrum.	<i>Woody.</i>
Teasel.	Verbena.	Yarrow.

NAMES FROM THE FAUNA OF THE DISTRICT.

Aquila (eagle).	Cuckoo.	Hummingbird.
Bittern.	Curlew.	Hylodes.
Blackbird.	Dendroica (warbler).	Kildeer.
Bluebird.	Dragonfly.	Kingbird.
Bobolink.	Eagle.	Kingfisher.
Butterfly.	Eel.	Lark.
Buzzard.	Falco, Falcon.	Lizard.
Canvasback.	Fieldmouse.	Locust.
Catbird.	Firefly.	Mallard.
Catfish.	Fishhawk.	Martin.
Chickadee.	Flycatcher.	Mayfly.
Chipmunk.	Glowworm.	Minnow.
Chrysalis.	Goldfinch.	Mockingbird.
Cicada.	Grasshopper.	Mouse.
Cowbird.	Groundsquirrel.	Mullet.
Creeper.	Hawk.	Muskrat.
Cricket.	Heron.	Nighthawk.
Crow.	Hirundo (swallow).	Opossum (aboriginal).

Oriole.	Redstart.	Thrush.
Ortolan.	Regulus (kinglet).	Tomtit.
Owl.	Robin.	Trout.
Papilio (butterfly).	Sandpiper.	Turtle.
Partridge.	Sapsucker.	Turtledove.
Pewee.	Skylark.	Vireo.
Pigeon.	Snowbird.	Wagtail.
Pintail.	Sora (aboriginal? =	Waxwing.
Quail.	ortolan).	Warbler.
Rabbit.	Sparrow.	Weasel.
Raccoon (aboriginal).	Squirrel.	Whippoorwill.
Redbird.	Swallow.	Wren.
Redbreast.	Tanager.	

ABORIGINAL TERMS FROM THE POWHATAN LANGUAGE.

This is the language of the aborigines formerly inhabiting the District and adjacent territory. The terms are taken from Strachey, Smith, and other early writers, the spelling being modified to conform more nearly with modern English orthography and phonetics.

Accohican—"to make a dish."	Assimi'n—walnut (hickory?).
Accondu—"blue berries of the	Assimoest—fox.
bignes of grapes, very pleasant."	Attomoi's—dog.
Ahshaha'm—lobster.	Awshocuttis—"a bird with carna-
Ana'nsecoon—"a reed mat."	tion-colored wings," with whose
Anascomin—acorn.	feathers the Indians adorned
Anath—farewell.	themselves.
Aotaw'k—rat.	Bocata'w—fire.
Apegwu's—mouse.	Caasun—village.
Apoca'n—pipe.	Cahangoc—goose.
Aposon—"a beast in bignes like a	Camatin'g—six.
pig and in tast alike" (opossum).	Camzowa'n—rain.
Appoans—bread (pone).	Cantoca'n—dance.
Aquataneek—a green tree.	Cawwin—sleep.
Aquinta'n—a boat.	Chacasow—crack.
Aracu'n—"a beast like a fox"	Cheawanta—"a robin red-breast."
(raccoon).	Chechinkamin—chinkapin.
Arrokoth—the sky.	Chehip—bird.
Asaqueth—"the clay they make	Checomaw'—muscle shell.
pipes of."	Chingissum—warm weather.
Ascamunk—eel.	Coan—snow.
Aspamu'—the earth.	Coagus—gull.
Asque'owan—arrow.	Commoti'ns—turtle.
Assentucara—"it shineth."	Coquain—calm.
Asse'ntamin—"a pear" (?).	Crenepo—woman.

- Cunnaiu—long.
 Cunse'nagwus—an Indian toma-hawk.
 Cuppatoan—sturgeon.
 Cuppanauk—gate.
 Cuttac—otter.
 Cutteru—"to grow high."
 Cuttoxeen—weary.
 Damisac—knife.
 Escowascus—sedge.
 Hanguequi'ns—"a little stone pot."
 Huspissa'wn—leap.
 JAPASAWS—chief of the Potomacs.
 Kecuttano'was—lightning.
 Kenewu'—sharp.
 Kequasson—"a pot to drink in."
 Kittasco'ok—adder.
 Macha'camac—"a great house."
 Mache'ss—low.
 Mahawk—gourd.
 Manawngwas—butterfly.
 Maugoit—great.
 Manote—basket.
 MAOCO—a man's name.
 Maracaw—"apple."
 Marakimmin—grape.
 Marahungoc—young goose.
 Mascohing—"parrot."
 Matic'awiac—pearl.
 Matassu'n—copper.
 Mawngwipacus—leaves.
 Mawsawn—nettle.
 Mayis—"going in a path."
 Mequanoc—a long feather.
 Mettacook—a stalk.
 Mettaquins—grass.
 Metux—bridge.
 Missanek—squirrel.
 Moccasin ("mawhcasun")—shoe.
 Mohocan—fish-hook.
 Moincaming—dead leaves.
 Momuscan—mole.
 Monachoc—sword.
 Monanaw—turkey.
 Moroke—cedar.
 Muscain—"glorious, smooth, or beautiful."
 Mussetaquao—circle.
 NACOCHTANK—the aboriginal settlement at the mouth of the Anacostia.
 Nammass—fish.
 Nawntam—wolf.
 Nawpin—sit down.
 Nepensun—dust.
 Neppawngunnu—blood.
 Nisake—a cane (plant?).
 Nissacan—reed.
 Nonattu—fawn.
 Nowanus—lost.
 Nusomon—below.
 Nuttacawm—deep.
 Nuttaquon—flea.
 Ocquins—"a watchet-colored bird."
 Octa'mocan—a cup or drinking vessel.
 Ohawas—a crow.
 Opain—white.
 OPECHA'NCANO—the brother and successor of Powhatan.
 Opommin—chestnut.
 Opotena'oc—eagle.
 Opunawk—groundnut.
 Oronoca—a garden.
 Ospanno—a turkey cock.
 Ossantamin—a pea.
 Papaso'—sunrise.
 Pascamath—mulberry.
 Pascorath—"the gold sparks in the sand" (mica).
 Pawcu'nnao—dark.
 Pawngun—a little.
 Peccatoa's—bean.
 Pemanataon—thread, cord.
 Penninaw—robe.
 Petawin—the ground.
 Piquaon—duck.
 Pittao—froth.
 POCAHONTAS—the daughter of Powhatan and friend of the whites.

Pocataws—wheat.	Tasa'ntaso—the whites.
Pocohawk—pestle, awl.	Tashoac—all is out.
Pocoons—a red dye.	Tatamahog—garfish.
Pocosac—gun.	TAYAC—the great chief of southern Maryland. Probably a title rather than a name.
Pomotaw—hill, mountain.	Tomahawk ("tamahaac")—hatchet.
POWHATAN—the great chief of the confederated tribes of the lower Potomac region.	Towaw—strong.
Porance—fire.	Tuckaho—"In June, July, and August they feed upon rootes of tockohow."
Porasap—a bag.	Tussan—a seat.
Pungo—ashes.	Uppowoc—tobacco.
Quanacut—rainbow.	Usawac—yellow.
Quangatarask—owl.	Utaca'n—dish.
Racaw—sand.	Utacaskis—lizard.
Rapanta—venison.	Uttacawai—panther.
Rarrascaw—air.	Uttapawntam—deer.
Rarenaw'—a chain, wampum.	Wawchesa'o—a nest.
Rasanear—run.	Wecuttis—rabbit.
Reconac—tobacco pouch.	Weputtahoc—a stake.
Rickahone—comb.	Winganoose—very good.
Sacaho'ok—"the cleere stones we gather."	WINGANUSK—the "great darling" of Powhatan.
Sawwone—salt.	Wingatu—ripe.
SECAWESA—a man's name.	Wiroance—a chief.
Shachahocan—stone.	Wisacanac—a rabbit skin.
Succohanna—water.	Wohaicank—fish scales.
Tacaho'ac—a mortar.	Woscan—a bone.
Tacquasu—short.	Wushagun—deer.
Tamacin—swim.	Wusicket—a brook.
Tamuscamaw—flowing water.	Yeocanta—river.
Tanaowa'm—where do you live?	Yohacan—house.
Tapaco—night.	
Taquit'oc—autumn.	

Respectfully submitted :

JAMES MOONEY, *Chairman of Committee.*

WM. H. BABCOCK.

W. HALLETT PHILLIPS.

W. H. HOLMES.

LESTER F. WARD.

The above report was read at a meeting of the Anthropological Society and discussed by Mr. W J McGee, Mr. Spofford, Librarian of Congress; District Commissioner Douglass, Mr. Edward Goodfellow, Mr. F. C. Somes, James Mooney, and others. Mr. Douglass expressed his warm approval of the suggestions and general recommendations embodied in the report. Mr. Spofford advocated the substitution of another alphabetic series in place of the present

letter names on the ground of liability of confusion between B and P, M and N, etc.

The most important suggestion was that of Mr. F. C. Somes, who proposed to call all principal city thoroughfares numbered streets, having those running in one direction to bear even numbers, while those running at right angles to them would be called after the odd numbers. This plan, which seems feasible, would obviate all possibility of confusion between streets and avenues of the same number, together with the necessity of using the term street or avenue in connection with the number in every case, and the only apparent objection is that it would necessitate a readjustment of the names of the present numbered streets.

There being no objection, the report was declared adopted.

THE NAVEL IN LOCAL NAMES.—The origin of the words for *navel* in the different languages of the world presents many curious facts. So we notice that in Germanic languages it is the diminutive of *nave* and *Nabe*, the center of a wheel or shield, the words *navel* and *Nabel* being the “small-sized center of the belly”—and in Latin *umbo* forms a diminutive *umbilicus*, the small boss or central eminence of any round body, and of the abdomen as well. In one of the earliest monuments of Greek poetry we see the corresponding word *δμφαλος* applied in describing an island of the sea, the isle of Ogygia, the home of the nymph Kalypso, who lived (Odyssey I, 50) “on an island surrounded by the oceanic floods, where the navel of the sea is” (*νήσω ἐν ἀμφιρύτῃ, ὅθι δμφαλος ἔστί δαλάσσης*). Many have been searching for the position of this (certainly *mythic*) island, which, as is stated in the passage, lay in the middle or center of the main, and when its elevation above the briny surface had to be pointed out, could with propriety be likened to a *knob* or *boss of the sea*. A commentator of Homer, Eustathius, who lived in the tenth century of our era, declared Ogygia to be the very center of the Atlantic and of the whole watery element. A round stone in the Delphian temple of Apollo was called *the navel* as marking the middle point of the earth (Pindar, *Pyth.* IV, 131; VI, 3), and by this term an altar in the city of Megara was also known. From the round stone in the Delphian temple the term *omphalos* passed over to the city of Delphi itself, for it became known at large as “the center of the inhabited world.” Roman authors called it *umbilicus terrarum* and *umbilicus Græciæ* after their Greek authorities, who

also named the city of Enna, Sicily, with its numerous temples, "the navel of Sicily" (Cicero, *Verrin. orat.* II, 4, 48). The pin or index of a sun-dial was called by the same term, being the eminence in the central point. It has also passed into botany, for the *navelwort* or *Umbilicus Veneris* received its appellation from a projection in the middle of its flower. From its more modern botanical name, *Umbilicaria*, was formed, by phonetic changes, the name of *Umbilix* and *Malix*, a village on a mountain slope in the Grisons, Switzerland, where the weed in question was found to occur. The round knobs at the ends of booksticks were called by the Romans *umbilici* or *cornua*, horns.

In gathering local names derived from the *navel* I have not been very successful, but will present what I have on hand, beginning with *Mount Tabor*, in Palestine, the name of which also appears as *Atabyrion* in another Semitic country and dialect, and is said to mean *navel*. America presents the following:

The artificial navel-shaped mound, from which the Cha'hta people ascended to the surface of the earth, as alleged, lies in Winston county, Mississippi, and was a sacred place in early periods. They called it the "navel of the country;" it showed the spot where the abdomen of a giant, the world's creator, lay below, and upon his command they climbed up there from the nether world.

Opposite the Indian pueblo of Zufi, on the south bank of the Zufi river, lies the ruin *Hálona*, one of the "Seven Cities of Cibola," and called by the early Spanish explorers *Alona*. It once occupied both banks of the river and some of the walls of ancient *Hálona* comprise to-day a portion of the southwestern section of the Zufi pueblo. The full Zufi name is *Hálona itiwana*, which we may with equal correctness interpret: "the middle place of happy fortune," or "the middle anthill of the world," or "the anthill at the navel of the Earth Mother." (Cushing in "The Millstone," vol. IX, 55, Indianapolis, 1884; *idem*, in *Compte Rendu Cong. Int. Amér.*, VII, 190, Berlin: 1890; Corresp. of F. Webb Hodge; cf. his review of Fewkes' Journal in *ANTHROPOLOGIST*, July, 1891.)

Cuzco, the ancient capital of Perú during the two centuries of the Inca dynasty, is said to be built in a local depression rising up in ringlike shape like a navel. Kosco meant *navel* in the "language of the Inca," according to Garcilaso de la Vega, but in the actual language of the Peru Indians, the Runa simi, is no longer used in that acceptance (Middendorf, *Keshua Wörterbuch*).

A. S. GATSCHET.

NOTES ON THE CHINOOK LANGUAGE.

BY FRANZ BOAS.

The Chinook language was spoken along the banks of Columbia River from the Cascades down to the Pacific Ocean. Since Horatio Hale published his great work on the philological results of the Wilkes Expedition, in which he made us acquainted with the languages of the North Pacific coast of America, no further material on the grammar of the Chinook has been published.

Two principal dialects of this language may be distinguished—the Upper Chinook, spoken from the Cascades to Grey's Bay on the northern bank and to a point a little above Astoria on the southern bank of the river, and the Lower Chinook, spoken on Shoalwater Bay, at the mouth of Columbia River and a little to the south of its southern entrance. The Upper Chinook is subdivided into a number of dialects, which differ to some extent, while the Lower Chinook had only two dialects—the Clatsop, which was spoken on Clatsop peninsula, and the Chinook proper, which was spoken on Shoalwater Bay. The difference between these latter dialects is very slight.

In the following lines it is intended to give a brief sketch of this language, based mainly on a series of texts collected by the author on Shoalwater Bay in 1890 and 1891. The remarks refer to the Chinook dialect, but occasional references to the Katlamat dialect of the Upper Chinook are given.

The following characters are used to render the sounds of the Chinook language :

a, e, i, o, u, have their continental sounds (short).

ā, ē, ī, ō, ū, long vowels.

ɛ the obscure *e* in *flower*.

ʼ, ʹ, ʻ, ʽ, ʾ, vowels not articulated, but indicated by the position of the mouth.

ä as in German *Bär*.

â as *aw* in *law*.

ô as *o* in German *voll*.

- separates vowels which do not form diphthongs.

ai	as <i>i</i> in <i>island</i> .
au	as <i>ow</i> in <i>how</i> .
l	as in English.
ll	very long, slightly palatized by allowing a greater part of the back of the tongue to touch the palate.
ɭ	posterior palatal <i>ɭ</i> . The tip of the tongue touches the alveoli of the lower jaw, the back of the tongue is pressed against the hard palate, sonans.
ɮ	the same, short, surd (Lepsius's <i>t</i>).
ɮ̣	the same, with very great stress of explosion.
q	velar <i>k</i> .
Q	velar <i>g</i> .
k	as in English.
ḳ	palatized <i>k</i> (Lepsius's <i>k'</i>), almost <i>ky</i> .
kx	might be better expressed as a posterior palatal <i>k</i> , between <i>k</i> and <i>ḳ</i> .
x	same as <i>ch</i> in German <i>Bach</i> .
x̣	<i>x</i> pronounced at the posterior border of the hard palate, with <i>d</i> position of mouth.
x̣̣	palatal <i>ch</i> , as in German <i>ich</i> .
s, c,	are evidently the same sound and might be written <i>s'</i> or <i>c'</i> , both being palatized. <i>c</i> (English <i>sh</i>) is pronounced with open teeth, the tongue almost touching the palate immediately behind the alveoli. <i>s</i> is modified in the same manner.
d, t, } b, p, } g, k, }	as in English; but surd and sonant are difficult to distinguish.
h	as in English.
y	as in <i>year</i> .
w	as in English.
m	is pronounced with semi-closure of the nose and with very light compression of the lips. It partakes, therefore, of the character of <i>b</i> and <i>w</i> .
n	is pronounced with semi-closure of the nose. It partakes, therefore, of the character of <i>d</i> .
ɿ	designates very great stress of the articulation of consonants.
!	designates very great stress of the articulation of consonants due to the elision of <i>q</i> .
ː	is a very deep laryngeal articulation due to the elision of <i>q</i> .
ˑ	a pause.

It will be seen from this list of sounds that the phonetic system of the Chinook resembles closely that of the languages spoken farther north on the coasts of Washington and British Columbia. We find an abundance of guttural sounds and palatized l's, frequent pauses,

many consonants pronounced with increased stress, and great variability of the vowels.

Variations of the vowel of the theme of nouns and verbs are due to various causes, namely, to emphasis, to diæresis expressing a plural or distributive, or to the endeavor to effect harmony between the vowel of the prefix and of the stem. *tell*, tired, when emphasized becomes *táll*: *nikt*, not, goes through all stages from *nekkt* to *nākt*; *alxe'l' ðkð*, he awakes; *alxel' ðyðkð*, they awake (theme -*ðkð*) shows the occurrence of diæresis conveying a distributive or plural meaning; *ðk'ala imðlak*, a male elk (theme -*k'ala*); *ðk'ðla ðpenpen*, a male skunk, shows the variation of the vowel of the theme, which takes place in order to bring about harmony between the vowel of the prefix (*ð*- masculine article, *ð*- feminine article) and that of the theme.

The language abounds in abstract terms. It is particularly remarkable that many concepts which we use in the form of adjectives occur as abstract nouns only. For instance, it is impossible to say "a bad man," but this is expressed by "the man, his badness." The Chinook does not say "I am sick," but "my sickness is on me;" he does not say "I shoot him," but "the action of shooting him I perform it against him." Abstract concepts of this character are very numerous.

There exist a surprisingly large number of onomatopoeic terms. Almost all names of birds may be considered such. A long series of verbs expressing actions accompanied by a noise or only more or less closely related to such noises are undoubtedly of onomatopoeic origin. These terms are not subject to inflection; they are repeated in order to express a frequent or repeated occurrence of the action. *Lex*, to tear; *qut*, to tear off; *ts/Ex*, to split; *Lxoðp*, to dig; *tEmm*, noise of walking; *k'Emm*, no noise; *hð'hð*, to laugh, are examples of words of this class.

The language has three well-defined genders. The genders are masculine, feminine, and neuter, the latter originally designating small objects. The gender is denoted by a prefixed article which is inseparably connected with the noun. In the dual and plural forms there is no distinction between these genders. We find the following articles:

Singular: Masculine, <i>ð</i> - or <i>ĩ</i> -	Dual, <i>c</i> -
Feminine, <i>ð</i> - or <i>ũ</i> -	Plural, <i>t</i> -
Neuter, <i>L</i> -	Indefinite, <i>L</i> -

Examples :

Masculine :	<i>ē'k'ala</i> , man.	<i>ēq̄tq</i> , head.
	<i>igō'ma</i> , bird arrow.	<i>ēlēmē'tk</i> , bed.
	<i>ikani'm</i> , canoe.	<i>ē'qēl</i> , creek.
Feminine :	<i>ō'ō'kuil</i> , woman.	<i>ō'ō'lax</i> , sun.
	<i>ō'kumatk</i> , baton.	<i>ōgō'wē</i> , raspberry.
	<i>ō'kulaitan</i> , arrow.	<i>unā'lala</i> , rattle of deer hoofs.
Neuter :	<i>l̄k̄jāsks</i> , child.	<i>l̄ā'pla</i> , roe.
	<i>l̄ē'tcam</i> , horn.	<i>l̄ā'semilqs</i> , nose ornament.
	<i>l̄t̄cuq</i> , water.	<i>lgōl̄ē'l̄ēxm̄k</i> , person.
Indefinite :	<i>l̄k'a'la</i> , a man.	<i>l̄ā'kil</i> , a woman.

Sometimes the masculine and feminine articles are used to distinguish large and small objects :

<i>ē'pqunx</i> , large basket.	<i>ō'pqunx</i> , small basket.
<i>ē'p̄np̄n</i> , badger.	<i>ō'p̄np̄n</i> , skunk.

The plural has generally the article *t-*, but often also *L-*. In numerous cases the article remains the same in singular and plural. Sometimes the plural has the feminine article, while the singular is masculine.

- Plurals with the article *t-* : *ēgoa-inē'nē*, beaver ; pl., *tgoa-inē'nē*.
l̄ē'cgan, plank ; pl., *tēc'gan*.
igitē'tcxala, piece of meat ; pl., *igitē'tcxala*.
- Plurals with the article *L-* : *ō'kumatk*, baton ; pl., *l̄kumatk*.
ō'p̄likē, bow ; pl., *l̄p̄likē*.
- Plural with the feminine article : *ikani'm*, canoe ; pl., *ōkuni'm*.

Suffixes denoting the plural are quite frequent. The most important is *-ukc* or *-ikc*. This suffix denoted originally a plurality of human beings. When used with numerals and indefinite pronouns it always designates human beings :

ka'nauwē, all ; *l̄kanauwē'tikc*, all people.
iq̄iēyō'qxut, old man ; *l̄q̄iēyō'qxtikc*, old people.
ē'ō'k, blanket ; *t!ō'kkc*, blankets.

-ma originally distributive (*-max* in Katlamat) :

ō'ō'lax, day ; pl., *l̄lālā'ma*.
ē'ma, bay ; pl., *l̄mā'lēma*.

-nana perhaps only with words designating relationship :

ōgu'lak, my aunt ; *l̄q̄e'lakēnana*, my aunts.

Sometimes very remarkable, although regular, forms originate through the elision of *q*. For instance, *ʔqəl*, creek; pl., *t!ā'LEma*. The theme is *-qəl*. The *q* is elided, and owing to this fact the *t* is strengthened. The *ʔ* is transformed into *ā* on account of the article *t*. *-ma* is the plural suffix mentioned before.

Irregular plurals are not very frequent:

ɬkʲāskʲs, boy; pl., *tqā'sōsinikc*.
ō'ōkuil, woman; pl., *lā'nɛmckc*.

Certain words occur only as *plurale tantum*; they are collective terms:

t!ōɬ, house; pl., *t!ōɬ'ma* (theme, *-quɬ*).
txut, smoke.
nauā'itk, net; pl., *nauā'itgɛma*.

The dual has the article *c*-. It has, as a rule, no suffix:

iqjēyō'qxut, old man; dual, *cqjēyō'qxut*.
ɬkʲāckc, child; dual, *ckʲāckc*.

Some words are *duale tantum*. In many cases the reason is obvious, while in others it remains obscure:

ckulkulō'ɬ, double-headed harpoon.
cɛqxō, double-pointed arrow.
c'ē'ɬxatct, rain.
ckɛni'm, toy canoe.

There are no cases. The possessive relation is always expressed by means of the possessive form. All local relations are expressed by means of the preposition *gə* (in Katlamat by the postposition *pa*). The indirect object and the instrumentalis are not expressed by a separate preposition or by a form of the noun, but by incorporation in the verb (see below).

As the possessive form is closely connected with the personal pronoun, I give the latter first:

I, <i>nai'ka</i> .	we two, inclusive, <i>ɬxai'ka</i> .	we, inclusive, <i>ɬxai'ka</i> .
thou, <i>mai'ka</i> .	we two, exclusive, <i>ntai'ka</i> .	we, exclusive, <i>ntcai'ka</i> .
he, <i>ia'xka</i> .	you two, <i>mtai'ka</i> .	you, <i>mcai'ka</i> .
she, <i>āxka</i> .	they two, <i>clā'xka</i> .	they, <i>lā'xka</i> .
it, <i>lā'xka</i> .		

These independent forms of the pronoun are compounds of *n*-, *m*-, etc., which are the pronominal stems.

The possessive form is derived from these stems, a few forms excepted. The possessive pronoun stands between the article and the noun. It has separate forms for the various articles:

MASCULINE.	FEMININE.	NEUTER.
Chief.	Chieftainess.	Dog.
my, <i>ilci'xak;Emana.</i>	<i>ōgu'xak;Emana.</i>	<i>lgē'xēwucx.</i>
they, <i>imē'xak;Emana.</i>	<i>ōmē'xak;Emana.</i>	<i>lmē'xēwucx.</i>
his, <i>iā'xak;Emana.</i>	<i>ōyā'xak;Emana.</i>	<i>liā'xēwucx.</i>
her, <i>icā'xak;Emana.</i>	<i>ōgō'xak;Emana.</i>	<i>lgā'xēwucx.</i>
its, <i>ilā'xak;Emana.</i>	<i>ōlā'xak;Emana.</i>	<i>lgā'xēwucx.</i>
our two selves, incl., <i>ilxa'xak;Emana.</i>	<i>ōlxa'xak;Emana.</i>	<i>līxa'xēwucx.</i>
our two selves, excl., <i>inlā'xak;Emana.</i>	<i>ōnlā'xāk;Emana.</i>	etc.
your two selves, <i>imlā'xak;Emana.</i>	<i>ōmlā'xak;Emana.</i>	
their two selves, <i>ictā'xak;Emana.</i>	<i>ōctā'xak;Emana.</i>	

The dual and plural have the same forms which are found in the neuter. It appears from this paradigm that the only forms which are not derived from the personal pronoun are the first person singular and the third person feminine singular.

Adjectives have always the gender of the noun which they accompany. They have also always the article, but the feminine is here *a-* instead of *ō-*, as it is in the pronoun.

many: masc., *ē'xau-it*; fem., *ā'xau-it*; neut., *lē'xau-it*; pl., *ō'xu-it*.

It was mentioned before that most of our adjectives are expressed by means of abstract nouns; p. e.:

a pitiful man, *ē'k'ala liā'xauyam* = the man his pity.

a bad woman, *ō'ō'kuil icā'q/atxala* = the woman her badness.

Among the numerals only "one" has the article and consequently gender. It has also a separate form for human beings:

All objects except human beings.	Human beings.
1. m., <i>ēxt</i> ; f., <i>āēxt</i> ; n., <i>lēxt</i> ; d., <i>clēxt</i> ; pl., <i>tēxt</i> .	m., <i>ēxat</i> ; f., <i>āē'xat</i> , etc.
2. <i>mōkt.</i>	<i>amō'ktikc.</i>
3. <i>lōn.</i>	<i>lō'nikc.</i>
4. <i>lakt.</i>	<i>lla'ktikc.</i>

Numeral adverbs as well as other adverbs are formed by the suffix *-ē*: *mō'ktē*, twice; *mā'lnē*, seaward.

The verb is incorporating to a degree. The subject, the direct and the indirect objects, are all expressed in it. We may distin-

guish between intransitive, medial, and transitive verbs. The first class are formed mainly by prefixing the pronoun :

nôc, I am there.

iôc, he is there.

môc, you are there.

ôc, she is there.

Lôc, it is there.

The same class embraces the numerous verbs which consist of an adjective or noun or an unchangeable (mostly onomatopoeic) term and an auxiliary verb. I give here the historical present of such a verb :

Lôx anê'xax, I fall ; *Lôx alxê'xax*, we two (inclusive) fall ; *Lôx anîêxax*, we two (exclusive) fall ; *Lôx alxê'xax*, we (inclusive) fall ; *Lôx antc'xax*, we (exclusive) fall.

Lôx amê'xax, thou fallest ; *Lôx amîê'xax*, you two fall ; *Lôx amcê'xax*, you fall.

Lôx nê'xax, he falls ; *Lôx nâ'xax*, she falls ; *Lôx alê'xax*, it falls ; *Lôx acê'xax*, they two fall ; *Lôx nô'xox*, they fall, etc.

The perfect is :

nkêx, I have been ; *mkêx*, thou hast been ; *ikê'x*, he has been.

akê'x, she has been ; *lkêx*, it has been, etc.

Transitive verbs always incorporate the object. When subject and object, and I may add here, indirect object, are nouns, the pronouns of the third person having the corresponding genders and numbers are incorporated. If the objects are pronouns, they are as well incorporated. Subject and object are prefixed, the former preceding the latter. While in most cases the pronouns can be readily recognized in these prefixes, there are a number of exceptions. The prefix of the third person singular masculine and feminine subject differs from the pronoun as found in the intransitive verb. Furthermore, in the combination : subject first person, object second person, certain modifications are found. I select a few examples in order to illustrate the formation of these forms :

-*ukl*, to carry.

I carry thee, *ayâ'mukl*. I carry you two, *ayâ'mtukl*. I carry you, *ayâ'mcukl*. I carry him, *anâ'yukl*. I carry her, *â'nukl*. I carry it, *ânê'lukl*. I carry them two, *anê'ctukl*. I carry them, *anê'tukl*. We two, inclusive, carry him, *atxgâ'yukl*. We, inclusive, carry him,

alxgā'yukl. We two, exclusive, carry him, *antgā'yukl*. We, exclusive, carry him, *antcgā'yukl*.

Thou carriest him, *amā'yukl*. You two carry him, *amtgā'yukl*. You carry him, *amegā'yukl*.

He carries him, *alcā'yukl*. She carries him, *agā'yukl*. It carries him, *algā'yukl*. They two carry him, *acgā'yukl*. They carry him, *atgā'yukl*, Somebody carries him, *aqā'yukl*.

The last form serves as a passive. A real passive is not found.

Whenever an indirect object accompanies the verb the pronoun of the indirect object followed by an *l*, which designates the indirect object, is also prefixed to the verb. It follows the pronominal suffix designating the direct object :

-ōl, to give (probably *-ō-* verbal prefix, and *-l* direction toward).
atcilxā'lōt, he gave it (masc. objective) to us ; *a-*, historical present ;
lci-, he, *-i-*, masc. object. ; *-lx-*, us ; *-a*, probably euphonic ; *-l-*, designating indirect object.
atcrmanā'lol, he gave thee to me.

The indirect relation of intransitive verbs is expressed in the same manner :

ē'tciŋc!a ayanā'lax, I am sick = my sickness is on me.

Medial verbs are such verbs as may be transitive, but appear without an object. They are formed by the reflexive prefix *-x* or *-xEl*, which follows the subject prefix and precedes the verb.

na-ixE'lqam, he shouts. *atcigE'lqam*, he calls him to himself.
agiō'la, she shakes him. *nē'xE!a*, he shakes.

The verb has not very many tenses. The most important are :

a- (prefix), the historical present ; *ayā'mukl*, I carry thee.

-a (suffix), future ; *yamō'kLa*, I shall carry thee.

a-x, present, expressing often repeated actions ; *ayā'muklx*, I used to carry thee.

There are practically no moods. The imperative of the intransitive verb is identical with the future, while in the imperative of the transitive verb the subject prefix is omitted : *ē'kLa*, carry him. The interrogative is formed by the suffix *-na* (*-lciē* in Katlamat), which is appended to the one mood of the verb.

All the numerous forms which we find in most Indian languages expressed by derivatives, and which we express by auxiliary verbs, are here expressed by adverbs, which are followed by the verb in its declarative mood :

<i>qā'doxuē</i> , must.	<i>qē'xtcē</i> , will.
<i>ai'aq</i> , can.	<i>qxā'oxal</i> , cannot.

There are but few derivatives. I found the following :

Frequentative	- <i>a-itx</i> . <i>aLx'ō'tōL</i> , he bathes.	<i>aLx'ō'tōLa-itx</i> , he bathes often.
"	- <i>l</i> . <i>agiō'la</i> , she shakes him.	<i>agiō'lal</i> , she shakes him often.
Causative	- <i>ta-mit</i> . <i>aLō'la-itx</i> , he stands.	<i>aqLōLā'ēlamitx</i> , somebody places him upright.

Word composition is not carried on to the same extent as among the neighboring languages. The language lacks altogether the faculty of incorporating nouns in verbs, which is so remarkable a feature of the Salishan, Wakashan, and Chimakuan languages. Local affixes are, however, quite numerous and of frequent occurrence :

- <i>p!</i> , into (- <i>pq</i> in Katlamat) ;	<i>ā'yōp!</i> , he entered.
- <i>pa</i> , out of ;	<i>ayō'pa</i> , he went out.
- <i>ptck</i> , from sea landward, from the middle toward walls of house ;	<i>ā'yōptck</i> , he went up from sea to land.
- <i>Lx</i> , from land seaward, from sides of house toward middle ;	<i>ā'yōLx</i> , he went down to the beach.
- <i>wilxt</i> , upward ;	<i>ayō'wilxt</i> , he went up.
- <i>itcō</i> , downward ;	<i>ayō'itcō</i> , he went down.
- <i>t</i> , towards speaker ;	<i>ayō'ltkam</i> , he brought it here.
- <i>k</i> , on top of ;	<i>Lōkōc</i> , it is on top of.
- <i>x</i> , on ground ;	<i>ē'xōc</i> , he is on ground.

It is worth remarking that reduplication is entirely absent from the language. The unchangeable words (mostly onomatopoeic terms) are duplicated (see above) in order to express a distributive—*i. e.*, to express that the action expressed by them refers to a plurality of objects :

kjau'kjau atci'tax, he tied them.

RISEING AND FALLING OF THE SKY IN SIOUAN MYTHOLOGY.—On page 344 of the *AMERICAN ANTHROPOLOGIST* for October, 1892, appeared an article on the "Rising and falling of the sky in Iroquois legends." The present writer calls attention to the Omaha myth of "The Chief's Son and the Thunders," published in *Contributions to North American Ethnology*, vol. 6, "The Dhegiha Language, Myths, Stories, and Letters," pp. 185-188. In that myth it is said that the chief's son and his followers came at length to the end of the sky, which was perpendicular and, after descending quickly into a chasm in the earth, ascended as quickly to its former place. Thus it acted continually; therefore, in order to pass across the chasm in safety, one must watch his chance. The chief's son and all his followers but the last one crossed the chasm, but the warrior at the end of the line hesitated too long and was carried down into the chasm; but on the return of the party the followers were sent over the chasm in advance of the leader, who, as he sprang over, extended one arm down into the chasm and drew up the dead man, whom he thus restored to life.

J. OWEN DORSEY.

AMERICAN FOLK-LORE SOCIETY.—At the annual meeting of this Society, held in Boston, December 28th and 29th, the following papers were read:

- Abby L. Alger. Survival of Fire-sacrifice among Indians in Maine.
- Fanny D. Bergen. Animal and Plant Weather Proverbs.
- Franz Boas. Doctrine of Souls among the Chinook.
- H. Carrington Bolton. A Modern Oracle and its Prototypes.
- A. F. Chamberlain. Christ in Folk-lore.
- J. Owen Dorsey. Two Biloxi Tales.
- Adolf Gerber. The Relation of the Tales of Uncle Remus to the Animal Stories of other countries.
- George Bird Grinnell. Algonquian Blackfoot Creation Myths.
- J. C. Hamilton. The Algonic Manabozho.
- H. R. Kidder. Chippewa Tale of the End of Hiawatha.
- George F. Kunz. Folk-lore of Precious Stones.
- Henry R. Lang. Folk-lore of the Azorian Colonies.
- John Maclean. Blackfoot Mythology.
- Henry Mott. Medicine Men.
- W. W. Newell. Examples of Forgery in Folk-lore.
- D. P. Penhallow. Customs and Traditions of the Ainos of Japan.
- Archibald R. Tisdale. Tales of the Abnakis.

PRIMITIVE DISTILLATION AMONG THE TARASCOES.

BY JOHN G. BOURKE.

During the month of September, 1891, it was my good fortune to be able to visit the romantically beautiful and fertile region of Lake Patzcuaro, in western Mexico.

It may be of interest to know that Lake Patzcuaro is the highest body of water in the world navigated by steamboat; that it is 45 miles long, 16 miles wide at its widest point, and 360 feet deep, with water crystalline and cold, and with scenery strongly recalling that of Lake Luzerne, in Switzerland. On its banks is situated the good-sized city of Patzcuaro—old, well built, and quaint—whose gentlemen still cling to the long, graceful Spanish cloak, the legitimate child of the Roman toga, and whose “young bloods” cavort about on spirited ponies, wearing suspended from their waists elegant silver-handled swords, probably one of the very last instances, at least on our own continent, of an adherence to this obsolete proof of gentility.

My purpose in going down there was to visit the famous coffee district of Uruapan and to examine the ruins of the college established by the Franciscans in 1581 for the education of the young men of the Tarasco race.

To get to these ruins, which are on the island of Tzintzontzin, it was necessary to hire a *chaloupa* or skiff, paddled by six stout Tarascoes. It was quite early in the morning when the water sprinkled from our paddles, and the Hotel Ybarra—the pompously titled inn wherein I had rested over night—faded from view astern. Our craft looked somewhat like a second-hand, unpainted Venetian gondola, with an absurdly high prow, upon which was perched the bow sculler or oarsman. The crew were jolly and good-natured, and two or three of them were able to speak Spanish with fluency. Many questions were plied by the natives as to the object of my going upon the lake and what business had brought me so far from my own country; but all these I answered gladly, intent on making up for it all in time. My note book was kept in hand all the while and soon began to give good evidence of the

patience and generosity of the Tarascoes, in turn, in responding to my interrogatories.

It was a very interesting boat ride and one productive of most startling information. The *patron* or captain of the *chaloupa* assured me—and all the crew confirmed his statement—that there was once a whirlpool in the middle of the lake, into which their ancestors in the olden time were accustomed to throw one or more babies every year. An earthquake or some other convulsion of nature some years ago had closed up this outlet (for such it would seem to have been), and ever since then the waters had been gradually deepening until they had now encroached upon fences, sheds, houses, and fields formerly high above their reach.

We passed by the rocky islet of San Piedrecito, to which priests still go on certain occasions to bless the waters of old Patzcuaro and the labors of the dark-skinned fishermen who sit stolidly and reverently in their home-made wooden *chaloupas* at its foot.

When I suggested that before the coming of the *padres* the medicine-men of the tribe must have occupied that isle of the fisherman the *patron* responded urbanely: "Yes, that is true; but in those times, you know, our grandfathers used to throw little babies into the water and eat human flesh."

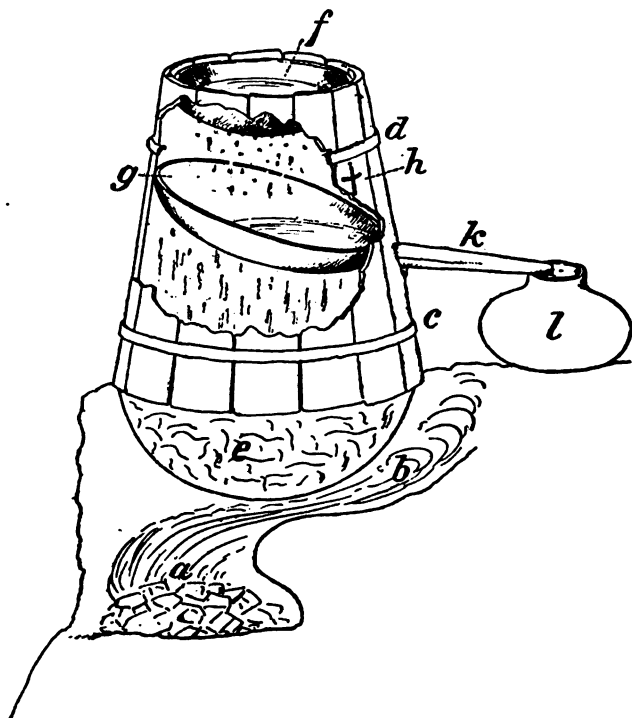
We made side excursions to many points to see the fishermen setting their nets or making hauls of the silvery sardine-shaped *chararas*, so highly prized by the epicures of the city of Mexico, and to watch the women and children on the bank industriously plaiting *petates* of tule or corn leaves, making baskets, or baking pottery beautiful in contour, fine in grain, and rich ruby-red in color.

Many *chaloupas* passed us, hurrying to Patzcuaro to sell or to buy. The whole scene was interesting, animated, and varied. Soon a thin line of smoke was seen issuing from the foliage on the crest of a knoll, and each Tarasco looked anxiously at me as the *patron* said: "They are making mescal over there. Would you not like us to row over? It is not very far." I replied that I would, but intimated that they must show me all about the mescal-making and keep their promise to guide me to Tzintzontzin. No sooner agreed than the prow of the *chaloupa* was ploughing its way to the primitive alembic.

I may omit any references to the kind treatment received from all the family on the island of Tzintzontzin—as this proved itself to be—and need not describe the shrine of the Madonna, in front of

which, in an earthenware brazier, was burning a small piece of *copal*, a favorite offering made by the Aztec tribes to their gods.

The still was erected at the edge of a vertical bank of hard clay, a situation which simplified labor very much. The whole apparatus was of the most primitive kind, but the product was exceptionally good and clear.



A Tarasco still.

At *a* was the fire, with outlet for smoke at *b*; *c* and *d* were hoops, against which were placed the staves, secured on the outside by other hoops or circles apparently of willow. At *e* was the mashed mescal in a large earthen bowl; *f*, on top of the still, was another large bowl full of cold water, which was ladled out by an attendant as it became heated and supplied afresh. The steam arising from the heated mescal condensed against the bottom of the bowl (*f*) filled with cold water and then dropped into a bowl (*g*) placed at

at angle. This bowl was called the *cuchara* or spoon. From the *cuchara* the mescal ran out through the tube *k*, made of mescal stalk, into the *olla* or water jar *l*. On one of the staves, at *h*, was a rudely incised crucifixion, marked there, as I was told, to ensure *buena suerte* ("good luck").

The entire process of preparing the mescal for distillation was in operation at the time and was explained in detail. Only the center of the plant, resembling a cabbage head and called the heart, was used, the exterior leaves being rejected, although they are rich in saccharine matter and are used as food by the Apache and Navajo Indians.

These hearts were first baked in "mescal pits" lined with heated stones and covered with wet grass and earth. Upon being transferred to shallow basins made in the ground and lined with flat rocks they were mashed into a coarse pulp with heavy wooden mallets, then exposed to the sun to insure fermentation. It was this fermented mass which I saw placed in the kettle of the still (at *e*).

In this description, bald as it is, I desire to call attention to what seems to me a very curious point. There was nothing used which was not strictly aboriginal; the crucifixion need not be excepted, as the sign of the cross has been a religious emblem of the American tribes and observed as such from Gaspe to Yucatan.

The wooden barrel was very rude in construction, the gaping seams being closed with wet clay and gum. The Tarascoes, from time immemorial, have been celebrated workers in wood and have felled and cut large pine trees of which they have built their *chauloupas* 25 or 30 feet long. They also make all the wooden spoons, ladles, and other kitchen ware used in that part of the country.

I am far from committing myself to the proposition that the Mexican Indians were acquainted with distillation before the time of the conquest. Indeed, when and where distillation was first practiced will perhaps never be known. The Chinese claim the discovery for one of their kings who lived 2600 B. C. I do not recall any reference to the distillation of liquors in the works of Sahagun, Motolina, or other early clerical writers on the manners and customs of the Aztecs. The omission, however, is not of great significance. Those writers have preserved for science much valuable ethnological material, but they observed and wrote from the standpoint of the missionary and not from that of the anthropologist. The word

vino (wine) occurs with some frequency in their treatises, but it has generally, and I think correctly, been regarded as referring to the fermented beverage *pulque*.

Mescal is distilled in all parts of Mexico, in the rudest hamlets, in the most secluded mountains, but always in the manner above described. A finer liquor called *tequila* is made by distilling the fermented sap of the maguey.

It would be natural to assume that among the first things the natives learned from the Spaniards after the conquest of Mexico was the manufacture of intoxicants. The Mexican peon has a natural taste and skill in such preparations, and uses not only the mescal and the maguey, but the Spanish bayonet and the yucca as well. He also makes from the *tuna* or Indian fig (the fruit of the *nopal* cactus), a kind of hard cider, called *colonche*, which is quite intoxicating.

I repeat that the failure of the Spanish writers to mention certain things is no great argument against their existence, and I cannot make this more clear than by saying that they have all ignored the employment by the aborigines of the trident and throwing-stick, which I found in daily use among the Tarascoes of Lake Patzcuaro. Prof. Otis T. Mason informs me that the specimen of the latter which I was fortunate enough to procure is identical with the *atlatl* which figures in the codices or Aztec picture-writings.

THE ANCIENT GRAVES OF THE VAZIMBA, the aboriginal inhabitants of the interior of Madagascar, are found scattered over the central province. These are shapeless heaps of stone, generally overshadowed by a *Fàno* tree, a species of acacia, which has a semi-sacred character, its seeds being used in divination. Could these graves, like the ancient English barrows, be opened, doubtless much light would be thrown on the rather difficult question of the affinities of these Vazimba; but to meddle with any tomb, much more one of these ancient ones, is one of the most heinous offences among the Malagasy. A considerable number of upright stones, termed *Vatolàhy* (lit. "male stones"), huge undressed blocks of granite, are also found on the hills and downs. These are memorials of former chieftains or of battles of the old times.—Sibree in *Proc. Royal Geog. Soc.*, p. 746, Nov., 1892.

MAKANGA CUSTOMS.—Mr. D. J. Rankin, in the November number of the *Scottish Geographic Magazine*, speaks of his arrival on the Revugwe at Kamsiki, in the Loangwa-Zambesi basin, Africa, as an occasion of great public rejoicing and festivity by the natives. "Several miles from the town I was met and escorted in by the chief's state band, consisting of flutes, drums, and native musical instruments, my near approach to the kraal being heralded by an incessant firing of muskets, tootling of flutes, banging of drums, and deafening shouts and cries from a crowd of two or three thousand people. Being led into the stockade by the chief, we were regaled in the courtyard by a number of amusements, lasting for several hours, which included conjuring, dancing, singing, and feats by strong men—the latter being similar to the feats performed in our own country fairs. In one of them a heavy wooden mortar used for pounding corn and rice, weighing about one hundred pounds, is placed on the stomach of a man, who is supported on two stools, and any one in the audience is invited to pound the rice or flour put in the mortar. A small wooden figure of a man is carefully placed on a mat by the performers, this figure being a kind of fetich to protect them from injury during their dangerous performance. These people come from the hill tribes, and their fetich created a great deal of amusement and ridicule amongst the higher-class Makanga sitting round."

WOMEN OF THE TROBRIAND ISLANDS.—The quarters of the principal chief of the Trobriand islands, British New Guinea, include seventeen houses, each occupied by a separate wife. At a little distance is the humbler establishment of the second chief, with the more modest allowance of five wives. Many of these ladies were old and far from prepossessing, but it seems that either from innate courtesy or some more prudential reason the Papuan always treats his older wives with more consideration than the younger. The people are all clothed, the women in fact possessing two petticoats, the one undyed, the second, used for dancing and other formal occasions, dyed and worn over the other; and they made a point of never coming into the governor's presence without this.—Trotter in *Proc. Roy. Geog. Soc.*, p. 791, Nov., 1892.

THE RURAL SCHOOL PROBLEM.

BY JAMES H. BLODGETT.

The changing relations between city and country, or urban and rural, population in the last fifty years have attracted general attention in Europe and America. Something like a law may be recognized in the experience of the United States, where the farming land is not yet all in the hands of individual owners. Omitting special influences like mining and timber-cutting, liable to be temporary, and some others liable to be more permanent, in limited districts, like fruit-raising and market gardening or the location of railroad stations, there is likely to be an increase in population of a newly settled agricultural town or county till owners occupy the land, by which time the population is likely to be at a maximum; then begins a decline. Immigration ceases, the children of the earlier settlers growing up leave home to try their fortunes on newer lands or in denser communities, and a little later those prosperously growing old in farm-work betake themselves to villages and towns for a more leisurely life. This might be illustrated all the way from Maine and from the Carolinas to the foot of the Rocky Mountains.

The city overwhelms us by aggregation of force and massiveness of concentration; but there is most hope for the physical life of a new-born babe in rural surroundings, not in the stifling pressure of lofty buildings that allows none but the wealthy to own homes. The best promise for a wholesome future to youth is in communities sufficiently compact to afford ready use of the modern post-office, railroad, and telegraph, and to furnish inspiring numbers for mutual effort without losing the beneficent influences of the farm, or at least of the garden and the orchard.

The family plans for preserving food from a superabundant harvest for a time of need, the selection and reservation of seed, the planting and cultivation, the care of animals, are part of the influences teaching the child and molding his character with a deeper power than any formal lessons. No school-room exercises with children accustomed only to brick walls and paved streets can do for them in certain important elements of character and knowledge

what is done for the country child by his surrounding conditions, even with the drawbacks of unrest and discontent with which so many endure rural life.

Opposite social conditions influence the organization and duration of schools in city and country. In the city one motive to lengthen the duration of school attendance is to provide a place of responsible supervision for children who cannot be kept busy under the eyes of their parents. In the open country the children can aid in raising or harvesting products under parental supervision. The city, either directly or by the power of credit, commands greater pecuniary resources than sparsely settled districts, and at any time of the year it can furnish the numbers necessary to organize schools. The rural occupations urgently press in special portions of the year, emphasizing the poverty of numbers which often makes it difficult to maintain a school. The conditions vary as we go from State to State, and as we go from county to county of the same State.

The report of the board of education of Massachusetts for 1890 gives three tests of the relative educational work of its fourteen counties, and the State census of 1885 shows the apparent rank in freedom from crime :

MASSACHUSETTS.

Rank of Counties in Public Education, 1890; in Freedom from Crime, 1885.

	1. Amount appropriated per child between 5 and 15 years of age.	2. Percent. of taxable property appropriated.	3. Ratio of average attendance to number between 5 and 15 years of age.	4. Combined average of 1, 2, 3.	5. Rank in freedom from crime, 1885.
1	Suffolk	Berkshire...	Barnstable..	Barnstable..	Dukes.
2	Norfolk	Franklin ...	Franklin ...	Middlesex ..	Nantucket.
3	Middlesex ..	Barnstable..	Plymouth ..	Plymouth ..	Barnstable.
4	Barnstable..	Hampshire ..	Dukes.....	Franklin ...	Hampshire.
5	Plymouth ...	Worcester ..	Norfolk	Norfolk	Franklin.
6	Bristol.....	Middlesex ..	Middlesex ..	Suffolk	Worcester.
7	Essex	Plymouth ..	Hampshire ..	Hampshire ..	Norfolk.
8	Hampden...	Bristol	Suffolk	Berkshire...	Hampden.
9	Worcester ..	Hampden ..	Essex	Worcester ..	Bristol.
10	Dukes.....	Essex	Berkshire...	Bristol	Berkshire.
11	Hampshire ..	Norfolk	Worcester ..	Essex	Essex.
12	Franklin ...	Suffolk	Bristol	Dukes.....	Middlesex.
13	Berkshire...	Dukes.....	Hampden ..	Hampden ..	Suffolk.
14	Nantucket..	Nantucket..	Nantucket..	Nantucket..	Plymouth.

By *amount of money appropriated per child between 5 and 15 years of age*, Suffolk county stands first, Berkshire thirteenth.

By *per cent. of taxable property* thus appropriated, Berkshire is first and Suffolk is twelfth.

By *ratio of average attendance to the school census*, Barnstable, which was fourth by the first test and third by the second, becomes first; Suffolk is eighth and Berkshire tenth. By combining all the tests, Barnstable leads the State.

Massachusetts is so uniformly earnest in popular education that the extremely dissimilar tangible results in her towns and counties are especially suggestive in estimating the effect of numbers and wealth on school organization throughout the nation.

Nantucket, last by every named test, nevertheless maintains good schools. It is an island with a small population, mostly native-born, but diminishing for the last forty years with a dying industry. Level Barnstable, which is Cape Cod, has been nearly stationary in population for sixty years, while the rural population of hilly Berkshire has been dwindling for a like period. Suffolk has increased in population and wealth through vigor absorbed from Nantucket and Cape Cod and Berkshire and other rural homes, native and foreign.

Our metropolitan cities would soon perish if the tide of country blood did not restore their waste. Let it be noted that Barnstable, a stationary, rural county—not Suffolk, with its populous Boston—makes the best record.

In this immediate connection we may compare the moral conditions as indicated by the record of convicts in the State census of 1885, in which Dukes and Nantucket had no convicts; Barnstable, one convict to 5,969 population; Hampshire, one to 2,424; Franklin, one to 1,628; Worcester, one to 1,516; Norfolk, one to 1,502; Hampden, one to 1,342; Bristol, one to 972; Berkshire, one to 901; Essex, one to 879; Middlesex, one to 391; Suffolk, one to 319; Plymouth, one to 291.

At the other side of the continent the record of counties of nearly equal areas emphasizes the material power of density of population and resources.

By *money raised per child of legal school age*, four such counties in California rank (1890): Napa, Sierra, Alameda, Contra Costa. By *per cent. on taxable property* they rank: Sierra, Contra Costa, Napa, Alameda. By *ratio of average attendance to the school census*

they rank: Napa, Sierra, Contra Costa, Alameda. By the three tests combined they rank: Napa and Sierra alike, Contra Costa, Alameda.

Alameda, lowest of the four counties in the three aspects, contains the city of Oakland and has thirty school children to the square mile, and highly developed schools. Contra Costa and Napa have about five school children each to the mile, and the mountainous Sierra but two. Alameda pays annually the liberal sum of \$4,500 for a superintendent, Sierra the meager recompense of \$625, which represents a greater effort of the tax-payer and a greater expense per scholar than would be necessary to pay \$10,000 in Alameda.

There are in New England more than five hundred schools averaging less than eight scholars each. Whatever is done with these pupils, their instruction frequently represents a vastly greater personal cost than gains credit in a comparison of teachers' monthly wages. Consolidation by transportation of pupils at public expense costs some \$25,000 a year in Massachusetts alone.

Consolidation of districts is a partial remedy for weakness, but space itself may be a barrier. Even icy Maine and balmy Florida have each a thinly settled county larger than Connecticut.

We may often strengthen the school as a coöperative agency by attention to public comfort and convenience—for example, in the improvement of highways. The whole social life, including the schools, would be elevated by facility of neighborhood association. In the great corn belt of the United States it has been a common experience for travel on the country roads to be absolutely stopped by mud. It would hardly be extravagant to say that the drain-tile factories have done more in the last generation for the rural schools of central Illinois than changes in the school law.

The child in the villages and rural districts is privileged to be trained, in a degree, in industrious habits by his parents, and he gains a stock of knowledge inaccessible to his city cousin. A noted physician of Kentucky, familiar with the classics and modern languages, pointing to a cabin with a log sawed out on the side to admit the light, said: "All my schooling was in a house just like that, about ten miles from here, in Bourbon county. I attended lectures and took special lessons after I was grown up." The Congressional Directory gives a bit of biography of some four hundred men. An overwhelming proportion, as boys, had only common

country school privileges, but carried studious habits into mature life either with or without collegiate opportunity.

Maine, a State still quite homogeneous, with diversified rural occupations, perhaps best preserves the conditions general when Daniel Webster and his compeers had their early training in winter schools. The schools of the State averaged but little over twenty-two weeks in 1889 or 1890. Even the town high schools barely exceed an average of six months in the year, and the young people are busy on the farm and in the shops and teaching the yet humbler schools in the intervals; yet Maine does not take an inferior rank in a comparison of her men and women with those of other parts of the Union.

Within a few years industrial training has received much attention, but its popular development has been irregular and almost wholly in the line of manufactures. The rural schools of central Europe and Scandinavia have gardens and orchards for instruction; the school-house is the teacher's home, and his tenure is permanent. We omit these features in our imitation of the great European teachers, and attempt to copy Pestalozzi and Froebel's kindergartens without the gardens.

From the nature of things, professional teachers are absorbed by the strong schools. It would be helpful to all schools, including colleges and universities, if there were more opportunities for scholarly persons to devote brief terms to the best technical training before teaching. The high schools of Maine distinctly aim to be helpful to the rural teacher, and the State of New York encourages the academic and high schools to give pedagogic training. This is suggestive for parts of the country where similar work is not done. The movable Teachers' Institute does an important work, but, taking the country as a whole, it is extremely irregular in its character, more valuable in stirring up general interest than in improving individual methods.

The value of statute law varies according to its relation to the public will. While more supervision, with consolidation to township or county control, may be generally beneficial, those closely identified with the pine woods of the Southeast, the wind-swept prairies of the West, the mountain States of either slope, are the best judges of the adaptation of any step to their respective circumstances.

We must not forget the danger of too much legislation. We can force trees into beautiful hedges under rules that would destroy

building timber. Many laws secured in a period of rapid change presently bind like a Chinese girl's shoes, distorting further growth while they remain. The over-sanguine and those with special interests are too often eager for new statutes, but the tendency in our States is toward longer legislative vacations, and the community at large has a sense of relief at the adjournment of law-makers.

Necessities inexpensive in many rural districts, in the cities mean larger taxes. The annual fuel bill of the St. Louis public schools is not far from \$25,000. For thousands of schools in the woods no account is made of fuel. Lots must be bought and substantial buildings must be erected in Southern cities. There are multitudes of Southern rural school-houses adequate for shelter from sun or rain erected by neighborhood effort, with so little money that they do not appear in any record.

Boarding around or distributing the cost of the teacher's maintenance in an indirect way, without contributing the money, can still be found in the effort of weak districts in New Hampshire and Pennsylvania. The laws of Georgia provide for ambulatory schools in regions where pupils are too scattered to be suitably collected in a permanent school, and the Scandinavians of the Northwest have maintained more or less instruction through teachers spending successive brief periods at different farm-houses and helping those who could gather about them.

Almost anywhere in the Union there is a belief that more money would greatly improve the schools. Sometimes the expression is accompanied by a belief that the people of a locality are already paying taxes to the extent of their ability and a recognition that public expenditure means additional taxation. In other cases there seems to be a vague idea that it is only necessary to appropriate money by some public authority to secure what is wanted. The variety of details to which different individuals would apply additional funds is suggestive: Some want money for school-houses, some to improve the equipment, some to pay higher wages to teachers, some for free books, some to extend the terms of school. In certain States there is a conspicuous call for money to pay the school officers for the time spent in school business. This is most pronounced in Virginia, where, in 1891, more than one-third of the county superintendents urged that the trustees be paid for the time devoted to schools sums varying, where specified, from one dollar a meeting to two dollars a day, with various limitations from

four to twelve days in a year. It is especially noticeable that the number of superintendents making this recommendation is more than double the number that made a like recommendation in 1890. A vast amount of work is done in the public interest by those who contribute their time for a few hours or more to the general promotion of the object in hand. Semi-public social organizations—scientific societies, for example—could hardly be maintained but for the zeal that leads members to accept official positions involving great labor without pecuniary compensation. The boundary line between the aid a citizen may fairly be expected to give a cause without pecuniary recompense and the aid which it is unfair to expect without such compensation varies with circumstances. If those directly interested are agreed in the policy of pecuniary compensation, and pay the bills thus incurred, the matter has only a general interest to students of social organization. If, however, local officers at present not paid are to be paid with funds drawn from persons not locally interested, as from a State or a national treasury or private benevolence, the effect upon the total outlay and upon general policy becomes more important.

The call for money from the denser communities, by tax or contribution, must not be too urgent. Many cities already pay a larger State school tax than is expended on their schools. This is the tendency in collecting taxes upon wealth and distributing them upon population. Cook county, Illinois, containing Chicago, pays more into the State treasury than it receives thence for its schools. Elsewhere specific grants are made to districts, as in California and Maryland, so that the strength of the strong is made positive to relieve the weakness of the weak. Many incorporated districts, both North and South, are very liberal in regard to tuition of pupils residing out of their limits.

Local interest is of prime importance. Without desire for knowledge and a marked degree of vigor in the recipients, external aid but hastens the dry rot of educational pauperism. Furthermore, thus far the rural districts have been able to concentrate their public effort mainly on their schools, while the cities must also maintain expensive water, fire, sewer, paving, lighting, and police departments, and the agents of city benevolent societies scour the country for means to help those below the reach of city schools. The chief reliance must be in intense self-help and the unlimited patience of earnest friends.

It is a question whether the inadequacy of rural schools is as serious relatively as some suppose. Many cities are unable to supply room for all their pupils, and in general city schools have much teaching to do to give the pupils a knowledge of nature equal to that with which the country child begins his school days. Waiving this view, however, it is manifest that the man or the family that goes out of a community whose institutions are fully established to try the fortune of developing mines or farms in new regions cannot expect to have the old communities maintain their own current schools and churches and maintain complete duplications for isolated pioneers. The weakness of the rural school is often but the inevitable weakness of all social life in the region where there are neither numbers to inspire the band of pupils nor money for wages of the teachers. Scores of frontier counties are without organization for the simplest municipal functions. In many a location, both those hopeful under new settlement and those despondent in the decline of abandonment, there seems to be no prescription needed for the school as such. As the physician would say, the disease is constitutional and its local manifestations will diminish as the patient improves. In other words, whatever tends to the general welfare of weak communities will tend to give character and value to their schools.

SIGNALING BY MEANS OF EXPLODING LEAVES.—Among the Iroquois there is a word applied to persons of either sex who go out into the woods to meet lovers and who by this means indicate to their paramours their love or their presence. In Tuskarora-Iroquois this word is, for the third person masculine singular, “*ra-’ë-r-’ähs*,” *he strikes a leaf*. To produce the sound the leaf, commonly of the basswood or other tree having large leaves, is placed on one of the hands held in the position for indicating the letter *o* in the “deaf and dumb alphabet,” and then with the other hand held flat striking the leaf sharply enough to cause it to burst with a report. There may be a general code of signals produced by this means to indicate the person making the sounds, his or her desires, or other like desirable things, or it may be the means agreed upon by two or more interested persons of carrying on a clandestine intrigue. Data are wanting to decide this question.

J. N. B. HEWITT.

**ARCHEOLOGIC EXPLORATIONS IN MICHOACAN,
MEXICO.**

BY F. PLANCARTE.

NOTE.—The following notes relate to a very interesting exploration of archeologic remains conducted by Prof. F. Plancarte of the College of San Joaquin, Tacuba, Mexico, in the year 1889. A series of objects of gold, copper, shell, stone, and pyrites, together with a set of eight photographs of articles of metal, clay, and stone, were forwarded to me for examination. The translation is not a literal one, being a compilation from several letters, but expresses the facts with sufficient clearness and detail.

W. H. HOLMES.

“The site of my excavations was a slight elevation almost at the southern extremity of the valley of Zamora, four miles southwest of the city of that name and two miles west of the present site of the Indian village of Tacona. This eminence is composed of two natural hills, called in local phrase ‘The Great Cat’ and ‘The Little Cat.’

“Being a student of American antiquities, and especially of those of my own country, I wished to make some excavations in order to obtain authentic specimens with which I might form a small archeologic collection to serve as a basis for my study of this science, and I chose the spot referred to because I had heard from the workmen of the region that at one time great cinerary urns of earthenware had been found in the skirts of the hills.

“Repairing to the place, I found on the principal hill, on a little plateau forming its top, a conical tumulus from four and a half to five meters in height by eight meters at the base, which communicated by an embankment with another elevation of square form having a base about equal to the diameter of the cone and of the same height. I began the excavations at the cone and shortly stumbled on a clay tripod. Continuing in the same direction, there were found walls made of cobble-stones not held together by mortar or cementing matter of any kind. These walls formed a square in the interior of the cone, which was filled with human skeletons at equal distances from each other and on the same plane; but, either

because the sepulchral chamber had been covered with wood and reed matting supporting earth and stones which fell down on the bodies when the wood decayed, or because the earth and stones were thrown on the bodies at first, the bones were commingled with debris, and many of them were reduced to powder and a large part of the earthenware was broken.

"It was not possible to examine the bones minutely, because they crumbled to powder on contact with the air; but the greater number of the teeth discovered, especially the molars, indicated adults considerably advanced in age.

"In a corner of the square enclosure there was a small structure of burned brick, which contained various bones in part carbonized or calcined; among them parts of the cranium (the parietal bones—the occipital and frontal), parts of tibias, ribs, femur, etc., of a single skeleton. On the fragment of cranium no trace of suture is seen between the parietals, and the molars, almost flat on the surface, indicated the great age of the deceased. In this enclosure, amid some half-carbonized utensils and shell ornaments, instruments of copper and earthen vessels, I found the gold films or plating and some five or six fragments of gilded beads, all mingled with ashes, pieces of coal, and carbonized remains of textiles. Skeletons were found not only in the walled enclosure of the cone, but also outside of it, among them being the remains of a young child. Mingled with the bodies were remnants of wood and matting which probably belonged to the roof. Quite close to the crania I found a very thin coating of a red substance which I took to be the coloring matter that served to paint the face of the dead.

"All of the objects found could not be got out entire and many crumbled on contact with the air. This is true especially of articles of copper and shell. Various utensils of red and black earthenware were found. The designs on some are very simple, consisting of circles and semicircles. The greater part of these utensils are basins resting on three hollow feet which are furnished with small balls of stone or clay to produce a sound when shaken. One shows complicated and handsome designs in white, red, and black. Many other articles may be briefly enumerated: A clay pipe, representing the human figure; a musical instrument, also of clay, with a human figure at one end (fig. 2); another musical instrument of Mexican onyx; a small idol of clay (fig. 4); an idol of white onyx (fig. 3), 17.7 centimeters high, whose eyes are of an artificial blue paste,

- and the two pupils and the corners of the lips of obsidian ; a vessel with a human head in relief on the outside, also of onyx ; three fish-hooks, four needles, many arrow-heads, hawk-bells of all sizes, a great number of little tubes, probably beads, a chaplet of very small beads, four tongs of various sizes, and numerous other objects, all of copper ; a unique necklace of iron pyrites, some beads of which I send you ; seven necklaces, one of small snail shells and the others of pectens and other varieties of shells, are included, together with many tubes made of some marine mollusk, and a *Busycon perversum* entire and without artificial work. There are many other kinds of ornaments and utensils of shell, the greater part of them closely resembling those described in your work on 'Art in Shell of the Ancient Americans.'



Objects of clay and stone obtained from a small mound, Michoacan, Mexico.

"An obsidian mirror polished on one side, circular in form, backed with an earthenware slab of the same diameter, and with the hollows of the imperfections on the unpolished part, which touches the slab, filled with soot, is interesting. Two hatchets of stone, three lance-heads, some arrow-heads, and some knives of obsidian may be added. Some vessels contained vegetal matter destined for food, and in others there were found lumps and dust of red and rose colored material.

"The excavations made on the contiguous pyramids showed hori-

zontal sheets of ashes and burnt earth a few centimeters in thickness, separated from each other by thicker layers of earth, without earthenware fragments or other articles. This led me to suppose that the monument was an altar.

"The skeleton found in the small angular enclosure of the mortuary chamber of the cone may be assumed to be that of the chief; the others within might be those of his kin and friends who were killed to keep him company in the other life, and those outside of the enclosure might be the remains of captives and slaves sacrificed while the funeral pyre was burning in the ceremony of the obsequies.

"The great moisture of the place and the action of time have completely destroyed most of the gilded objects, leaving only the plates or films, which I found in rather large numbers; a very few fragments of beads still retain the gilding. The material is crude earthenware, in some cases burnt, not in an oven, but in the fire that served for the burning of the body with which they had been buried and whose carbonized bones were found in the tomb.

"Excepting the bead fragments, plated with a thin film of gold, there is nothing in this sepulcher that might throw doubt on its pre-Columbian character. No trace was found of glass beads or of the numberless trinkets used in trade by the Spaniards or paid for services rendered them.

"This fact and the many vexations inflicted by the whites at the time of the conquest upon the Indians of Xacona—the province having been granted to the notorious Nuño de Guzman—forbid the idea that these sepulchers were built after European had been substituted for American art. The theory of the European origin of the gold-plating becomes still less plausible as the history of the conquest and colonization of Michoacan is better understood, when it is considered that before the middle of the 16th century all the Indians of these regions had embraced Christianity and were subject to the intolerance and excessive religious zeal of the Spaniards of that epoch. In subsequent centuries, when Christian customs had already taken root among the Indians, surrounded as they were on all sides by convents and by forts and farms of Spaniards, they could not easily have eluded the suspicious vigilance of the monks, soldiers, and landlords in celebrating rites of the nature of those that probably took place at the burial of the bodies found, which, as they required some time and preparation, could not have passed

unperceived in a place like 'The Cats,' open to the view of all the Spaniards, who in considerable number inhabited the surrounding treeless region.

"Neither can modern fraud be suspected, because I myself was present and actively inspected the work in company with Mr. Hunt, an American friend of mine, a lover of antiquities and well conversant with the Mexican language, so that there was no chance of deception by the workmen, who, moreover, had no motive for deceiving. In these regions the importance of ancient objects is so little known that all thought I was looking for nothing but treasure under the pretext of seeking antiquities, nobody being able to comprehend that the broken potsherds I brought to light had any value. To my mind there is not the least doubt that this gilding was a pre-Spanish art, and Mr. Hunt's conviction is the same.

"In another small elevation at the foot of the hill where I made the first excavations a skull was found with filed teeth. There were countless numbers of pieces of earthenware and three large cinerary urns which contained ashes without a trace of bones. In these, perhaps, were deposited, according to the reported custom of the ancient Tarascans, the residue from combustion of the remains of warriors killed in battle. In one of these urns, the only one that could be preserved, remnants of painted figures were found. Here, as in the first tumulus, there was a square stone enclosure, and in its center were placed the urns in a row parallel with the east and west sides. Under a skeleton in the northeast angle I found fifty clay utensils of similar form, placed one above the other, the lower being larger than the upper. The central vase was accompanied by four others of various sizes and of the same figure.

"I send also some objects of copper and of shell from among those found. A shell tube and a copper cylinder still retains the carbonized or oxidized fragment of string that served to attach these ornaments to the garment or person. Special attention is due, in my opinion, to the small copper beads, which, mingled with bells, formed a collar. Of these I send you specimens, as well as others of shell and other material, together with the trinkets that were tied to them. There is an object of shell in the form of a semicircular band with two small holes at the free ends for suspension. The exterior surface is ornamented with three button-like nodes. In the museum of Morelia I saw similar objects, but at no other place.

"In the future I shall send you such things as I find, either in photograph or, if possible, the objects themselves, and you may rest assured that I shall send you nothing the authenticity of which is not sufficiently established. Unfortunately many persons, especially in the Capital, busy themselves in the fabrication of ancient objects, and for this reason I place no trust in any one but myself or in persons who can have no possible interest in deceiving me."

INDIANA ACADEMY OF SCIENCE.—At the eighth annual meeting of the Indiana Academy of Science, held in Indianapolis, December 28 and 29, the following papers of anthropologic interest were read :

Evidences of man's early existence in Indiana, from the oldest river gravels along the White Water river, by A. W. Butler.

The Crawford mound, by H. M. Stoops.

Notes on archeology in Mexico, by J. T. Scovell.

Ancient earthworks near Anderson, Indiana, by F. A. Walker.

Archeology near Tippecanoe county, by O. J. Craig.

Some Indian camping sites near Brookville, by A. W. Butler.

Remarkable prehistoric relic, by E. Pleas.

The mounds of Brookville township, Franklin county, Indiana, by H. M. Stoops.

Remarks on archeological map making, by A. W. Butler.

STONE-AXE CURRENCY IN BRITISH NEW GUINEA.—Although the native canoe-builders in the Louisiade archipelago work with adzes made of hoop-iron, the payment for their work is made in stone axes, ten to fifty of these being the price of a canoe. The stone axe is still the accepted medium of exchange in large transactions—pigs, for instance, and wives are valued in that currency. It is only fair, by the way, to mention that the purchase of a wife is stated by the natives not to be such in the ordinary sense ; the articles paid are, they say, a present to the girl's father.. In Mowatta, sisters are specially valued, as they can be interchanged with other men's sisters as wives.—Trotter in *Proc. Roy. Geog. Soc.*, p. 795, Nov., 1892.

MAN AND THE GLACIAL PERIOD.

BY W J MCGEE.

I.

Wheresoever workers assemble, there idlers gather to feast on the fruits of honest toil ; a part are pitiable paupers, some traffic in unwholesome wares, others swindle the unwary under the cloak of honest dealing and cheat justice by specious pleas, and still others steal and rob. Thus the laborer is always the prey of the idler, and progressive mankind is handicapped by the burden of the helpless and the perverse.

In like manner the workshops and market-places of science are haunted by harpies ; a part are the feeble of mind who always absorb but never produce, some starve and poison hungry minds with the husks of fiction and the lotus of myth, others foist falsehood on the unwary under the guise of science and hide from justice behind shields of skillfully-woven words, and still others scoff at reason and rob knowledge of its glory. Thus creative genius is the prey of intellectual parasites, and the progress of knowledge is hindered by the helpless and the perverse.

Anthropology is the youngest of the sciences, and even yet is barely crystallized out of the original magma of unsystemic thought ; moreover, anthropology is the most complex and obscure among the subjects of knowledge, so that its field gives but treacherous ground even for the cautious student. Yet the science of man is peculiarly attractive to human kind, and for this reason the untrained are constantly venturing upon its purlieus ; and since each heedless adventurer leads a rabble of followers, it behooves those who have at heart the good of the science not only to guard carefully their own footsteps, but to bell the blind leaders of the blind. The blind leaders are sometimes comparatively innocent traffickers in the imaginary, like unto the sellers of poison drinks, and sometimes the less pardonable deceivers of the unwary and defeaters of justice, like unto commercial swindlers ; while the blind led are the dupes of the one and the victims of the other.

No question in anthropology is more enticing than that of human antiquity, and there is much writing on the subject—some good, more bad. In the latter class fall two recent publications, which have much in common. The first of these is Doughty's "Evidences of Man in the Drift;"¹ the second is Wright's "Man and the Glacial Period."² Both works profess to treat of the geologic antiquity of man, though neither author can be classed as geologist or anthropologist. The former is a numismatist, a member of the American Numismatic and Archæological Society, and makes no pretense of geologic skill or repute; the latter is a professor of theology in a theologic seminary, yet lays claim withal to geologic skill, which serves to render his writing the more specious.

II.

Mr. Doughty appears to have made a large collection of ice-wrought and water-worn pebbles and ferruginous nodules from the glacial drift, and to have found in their varied and curious forms suggestions of elaborate art. The ferruginous nodules are his most precious relics, abounding as they do in the fantastic forms of clay cemented by iron oxides. "To geologists these tablets are known as a variety of clay stones" (page 13); but to Mr. Doughty they are engraved tablets rich in records of the past. "They bear upon their flattened surfaces figures of human and animal forms, sometimes singly represented, but more frequently in groups," of which one "represents a man with Caucasian features sitting in the presence of several highly-colored individuals, who approach him with bowed heads. In each instance, either the seated figure holds a staff bearing the head of a serpent, or the staff is held before or behind him by another. The seated figure almost always wears an

¹ *Evidences of Man in the Drift*—a description of certain archæological objects recently discovered in Massachusetts, Connecticut, New York, Pennsylvania and New Jersey: read before the American Numismatic and Archæological Society, March 28, 1892; by Francis Worcester Doughty. New York: privately printed, 1892.

² *The International Scientific Series. Man and the Glacial Period*; by G. Frederick Wright, D. D., LL. D., F. G. S. A., professor in Oberlin Theological Seminary, assistant on the United States Geological Survey, author of *The Ice Age in North America*, *Logic of Christian Evidences*, etc.; with an Appendix on Tertiary Man, by Prof. Henry W. Haynes (fully illustrated). New York: D. Appleton and Company, 1892.

elaborate feathered crown resembling that worn by the Palenque figures" (page 10). "Having no desire to theorize," Mr. Doughty merely suggests that the scene represents "the ruler of the serpent clan, or totem, receiving homage from * * * subordinate tribes." "Many of these clay tablets are painted, but the arrangement of color, which resembles the Chinese style, is such as to render it very difficult to determine the nature of the scenes depicted." They are also patinated. A perplexing feature, however, is "the want of proper division between the figures," which is ascribed to a fundamental idea of "space economy," and which "to our eye creates hopeless confusion. The large figures are made up of many smaller ones, and the designs are hard to decipher. * * * A foot in one group is liable to serve as a head in another, the arm of one becomes the leg of another," etc. Moreover, "a specimen held one way shows one design, reversed another, turned again, still another, and so on up to four." Most readers will heartily concur in the author's qualified opinion that "it is hard to understand such artistic methods" (page 11). The sculpturing is not external alone: "Many of the tablets contain a layer of clay through the center. * * * This interior layer of clay presents a second face as perfect as the first, and in every case is found worked up with figures or painted;" and "the most perfect depictions of the human form * * * were found upon the inside clay surfaces of some of these stones." Mr. Doughty's active imagination is able to find not only "traces of animal matter" in the tablets, but "parchment or skin dressed in clay;" and upon this scroll "appears an excellent male head, a full figure of a very fat gentleman, and other devices" (page 12). In short, "these tablets appear to be simply the clay books of the men of the drift;" and this interpretation is sustained by a quotation from Job, xix, 23 (page 13).

The pebbles are hardly less significant to Mr. Doughty; many are heads in profile and full face; some bear "Indian figures and feathered head-dresses strongly marked. Others represent faces of a distinctly Caucasian type, and are often heavily bearded. Sometimes the beard is represented as a mere goatee, at others as being blown by the wind, at others still cut square after the Assyrian style." "Other heads have been found of strongly-marked negroid features and cranial shape;" and it is truly remarkable that the Caucasian pebbles are white, the negroid pebbles black and the Indian pebbles brown, and even more remarkable that the Caucasian heads

"wear hats of various recognized patterns" (page 9). Most striking of all is the solitary instance "of a white face with strongly-marked Celtic features, and a heavy red beard and moustache." The author suggestively adds, "I have found no representative of the cow, but of the man-headed bull I have several examples" (page 10). Other "existing animals" are "the dog, horse, sheep, rabbit, black bear, wolf, anthropoid ape, elephant, green adder, parrot and smaller birds, and the dolphin or whale." There are also many prehistoric animal forms, including "an animal of hippopotimus [sic] type, a large web-footed bird somewhat resembling the dodo, and, lastly, a reptile with a long snout and flattened paddle-like tail" (page 10).

Not content with proving the existence of man in the drift by these remarkable carvings, Mr. Doughty ventures to predict that the "Old Man of the Mountain, that gigantic human profile cut on the New Hampshire hills" (an imaginative sketch of which embellishes the work), was carved out "untold ages ago by the men of the drift" (page 15).

It should be added that Mr. Doughty rejects the "well-known glacial theory" and accepts the view of Ignatius Donnelly, that "the drift was suddenly thrown upon the earth either by the contact of our planet with a comet or by some other agency not understood" (page 7).

In brief the book is a bundle of absurdities worthy of notice only because it is representative of the vain imaginings so prevalent among unscientific collectors and because its maleficent influence has been multiplied by favorable press notices.

III.

The Reverend Professor Wright begins with an introductory chapter, in which he discusses the characters of existing glaciers. He says: "A *glacier* is a mass of ice so situated and of such a size as to have motion in itself. * * * Upon ascending a glacier far enough, one reaches a part corresponding to the lake out of which a river often flows. Technically this motionless part is called the *névé*. * * * The *névé* is the reservoir from which the glacier gets both its supply of ice and the impulse which gives it its first movement" (pages 2, 3). Unfortunately the author does not indicate how a moving body can have a motionless part, nor how

it receives both matter and motion from this motionless part. He fails, in short, to indicate what portion, if any, of his statement is true.¹

The second chapter treats of existing glaciers and the third of glacial motion, and in so far as they are made up of quotations from trustworthy observers are worthy of high confidence. It is to be regretted, however, that the quotations are not more extensive and in some cases better selected—for example, the observations of Sir Wyville Thompson in the antarctic region are ignored. It is to be regretted even more deeply that the author speciously defends his own blundering attempt to measure the rate of ice motion in Muir glacier instead of accepting the excellent series of measurements by Professor H. F. Reid. In 1886 he sought to measure the movement of this magnificent glacier by “observations * * * with a sextant upon pinnacles of ice recognizable from a base-line established upon the shore” (page 47), and obtained a value of 70 feet per day. In 1890 Professor Reid measured the ice flow at the same season by theodolite readings on a line of flags at approximately equidistant points across the glacier, the observations being made from two stations on opposite sides of the stream. Two independent series of readings were made, each covering a period of three or four days; and partly for the reason that they were designed to correct a manifest error, the observations were made with exceptional care. The measurements show that the daily motion ranges from a few inches near the sides to about 7 feet toward the center, the mean being 4 or 5 feet.² The reverend professor seeks to impugn this excellent work by specious arguments (page 47), and even falsifies Reid’s record by speaking of “ten feet per day in the most rapidly-moving portion observed,” while Reid’s highest figure is 7.2 feet.

¹ Our foremost glacialist, Professor T. C. Chamberlin, says of this remarkable exposition: “As a matter of fact, the *névé* moves like other parts of a glacier, and the signs of such motion are indicated in the cut on the very page before the reader as he follows this astonishing statement. The motion of the *névé* has been a matter of common knowledge for half a century, and is absolutely beyond question. The comparison with a lake is wholly misleading, and evidently springs from a fundamental misconception of a glacier.”—*The Dial*, vol. xiii, 1892, p. 303.

² *Nat. Geog. Mag.*, vol. iv, 1892, page 44.

Chapter IV is devoted to "Signs of past glaciation." These signs are enumerated as (1) scratches upon the rocks; (2) extensive unstratified deposits; (3) transported boulders; and (4) extensive gravel terraces. The chapter is elementary if not puerile, and is characterized by egregious and misleading egotism. It purports to summarize the work of a large number of geologists in different countries, chiefly in the United States, yet but two American geologists are mentioned, while the first personal pronoun appears in a score of places, sometimes in deceptive connection. Thus he says (page 62): "I have traced this limit of southern boulders for thousands of miles across the continent, according to the delineation which may be seen in the map in a later chapter;" and again he extols "our map" and depreciates Professor Chamberlin's earlier mapping by comparison; while in fact his map is little more than a reduction of a map published by Chamberlin years before, and the Reverend Professor Wright never followed "across the continent" any of the lines indicated upon it and never made any observations in the entire region which are accepted with confidence by leading American geologists. Moreover, the enumeration and description of "signs of glaciation" is reprehensibly incomplete and archaic. Probably the most trustworthy and certainly the most widely-spread evidence of glacial action is found in topography. The American drift is known to be of glacial origin not only from its similarity to the moraines of living glaciers, but from a distinct surface configuration, entirely different from that produced by water or any other geologic agency except ice; and extensive drift-free areas are characterized by a topography which could not have been produced by running waters, or by any other agency except moving ice. It is the function of geology to interpret these topographic forms through that branch of the science known as "geomorphy," or sometimes as the New Geology; and much of our knowledge concerning the glacial history of the continent has been acquired thereby; but there is nothing in the Reverend Professor Wright's numerous writings to indicate the slightest comprehension of the principles of geomorphy.

In the fifth and sixth chapters "ancient glaciers" are described at dreary length; for the description is a mélange of crude observation, misleading quotation, and deceptive egotism. Within a generation glacial geology has made great strides, and nowhere has the progress of the science been more rapid than in the United

States. One of the results of the brilliant researches by Chamberlin, Winchell, Salisbury, Gilbert, Smock, Leverett, and other geologists is the recognition of a complex glacial history, including two, three, or more distinct ice invasions separated by intervals of mild climate; a history so complex and long-continued that, according to the independent estimates of different geologists, if the postglacial period is represented by unity, then the period which has elapsed since the beginning of glaciation must be represented by two figures. But this conclusion of modern science is not recognized by the Reverend Professor Wright save when he seeks to conceal its evidence, and through a specious combination of quotation and suppression to misrepresent the views of competent geologists. Thus his description is superficial and warped, and his conclusions are worthless or unintelligible. A generation ago the description and conclusions might have passed for science; to-day they rank as charlatanry.

The seventh chapter, "Drainage systems and the glacial period," is a systemless catalogue of a wide variety of interesting but distantly related facts. It is the function, and indeed the end, of science to classify phenomena in such manner as to indicate natural relation; but the arrangement in this chapter, if arrangement there be, is not such as to set forth natural relation, or geologic history, or science, but such as to conceal relation and give a false air of simplicity and unity to glacial history, and thus to contravene modern science. For example, the author refers to Winchell's work on the recession of the fall of St. Anthony at length (pages 209, 210), but in such manner as to suppress Professor Winchell's conclusions as to the bipartition of glacial history; and on later pages (233-237) he quotes Russell and Gilbert on the fossil seas of the Great Basin in such manner as to convey an impression of fairness and completeness, yet in such terms as to conceal their conclusions concerning the bipartition of the lacustral history of this part of the continent.

To the anthropologist the interest of the subject to which the work is nominally devoted centers in the eighth chapter, "Relics of man in the glacial period." The instances in which "the relics of man are directly and indubitably connected with deposits of this particular period east of the Rocky Mountains" (page 254) are (1) the Abbott argillites from the Trenton gravels; (2) the Metz "paleoliths" from Madisonville and Loveland, Ohio; (3) the Cresson "paleolith" from Medora, Indiana; (4) the Mills flint from Newcomerstown, Ohio; and (5) the Winchell-Babbitt quartz chips from

Little Falls, Minnesota. In addition he introduces in evidence (6) the Cresson argillite from Claymont, Delaware; (7) the Calaveras skull and other relics from the Pacific coast, and (8) the Nampa figurine from Idaho, with the implication that the first of these indicates the existence of early glacial or preglacial man and the others preglacial or Tertiary man—the implication being deceptively guarded, however, by indefinite expressions and meaningless cross-references.

Now the first mentioned instance (the Abbott argillites) cannot be accepted by reason of the recent splendid work of Professor Holmes, who has shown, *first*, that the supposed paleoliths are not finished implements, but work-shop rejects or blanks; and, *second*, that there is grave reason for questioning whether the objects are not confined to the modern talus—*i. e.*, whether they occur in the Trenton gravels at all.

The second instance was formerly accepted by archeologists as evidence concerning the distribution of the hypothetic glacial man whose existence was supposed to be proved by the Trenton and Little Falls testimony; but since the occurrences are isolated, since the finder is not a skilled geologist able to discriminate between undisturbed glacial deposits and the talus derived therefrom, and since in one case similar objects occur on the surface above the point at which the "paleolith" was found, the presumption is against the evidence and the "finds" cannot be accepted as proof of the existence of man during the glacial period. The same must be said also of the third and fourth instances; and in connection with the last it is necessary to observe that the indirect personal statements of the Reverend Professor Wright (page 251) are unworthy of confidence partly because they are indirect, partly because his incompetence as a geologist is tested by another of his "instances" (the Nampa figurine).

The fifth instance (that of Little Falls) must be rejected because Professor Holmes, with Professor N. H. Winchell, who first found artificial flakes in the surface sands at this place, has within the year shown by means of excavations and extended surveys that there is no implement-bearing stratum at the locality in question, and that the quartz chips are confined to the talus and to the surface soil and subsoil within reach of the windfall excavations now pitting the surface of the glacial terrace. It is painful to learn that a conscientious observer like the late Miss Babbitt should be at fault in a matter of

so grave import ; enough to say that the original discoverer accepts Professor Holmes' conclusions.

The sixth instance (Cresson's Claymont argillite) must be rejected, *first*, on the ground of inherent improbability, because its acceptance would at once multiply human antiquity by 10, 20, or 50 ; *second*, because of the presumption that the object really occurred in the talus ;¹ and third, because of the utter lack of definitely corroborative testimony. It is to be observed that Professor Wright's personal plea concerning this instance is incompetent, irrelevant, and immaterial because his conception of glacial history is without time basis—he fails to recognize the succession of widely-separated episodes of which the glacial period was made up. His expressions, too, are misleading ; his declaration that “both Mr. McGee and myself have visited the locality with Dr. Cresson, and there can be no doubt that the implement occurred beneath the Columbia gravel” (pages 258, 259), conveys the idea that the three parties named concurred in the observation and the conclusion, while as a matter of fact no more than two of the trio were ever on the ground at the same time, only one made the original observation, and one at least emphatically repudiates the conclusion that the “implement,” if implement it be, occurred underneath the Columbia gravel. The distortion of fact in this declaration smacks of the shyster.

The seventh instance cannot be accepted by any cautious archeologist at the apparent value assigned by the reverend professor. There is, indeed, a large body of testimony concerning the association of human relics in auriferous gravels beneath broad lava sheets on the Pacific coast, but the gravels and lava sheets have not been correlated with the glacial deposits of eastern United States or Europe, and their antiquity, either in years or in terms of geologic chronology, has not been determined.

The eighth instance (the Nampa figurine) is the most satisfactory of all, since it affords a measure of the competence on the Reverend Professor Wright as a geologist and as a reasoner of the important subject of the antiquity of man. It is alleged that in 1889 the figurine, a brittle, baked-clay image as fragile as a clay pipe-stem, was brought up in the sand pump used in connection with a heavy drill in boring an artesian well at Nampa, Idaho, from a depth of 320

¹The presumption implicitly accepted by Mr. Cresson in a recent publication—*Science*, vol. xx, 1892, page 304.

feet and beneath a heavy lava sheet. Now, it is a fact that one of the best-known geologists of the world chanced to visit Nampa while the boring was in progress, and the figurine and the pretty fiction were laid before him. He recognized the figurine as a toy such as the neighboring Indians give their children, and laughed at the story; whereupon the owner of the object enjoined secrecy, pleading "Don't give me away; I've fooled a lot of fellows already, and I'd like to fool some more." The geologist in question gave no further thought to the matter, knowing that so transparent a fraud would never deceive even a tyro in geologic science; but when it came to the notice of the Reverend Professor Wright he accepted the fiction and far outstripped the jocular finder by foisting it in the public print as evidence of great human antiquity. It may be added that while the figurine has attracted much attention among archeologists, several (including Professor Holmes) refused to accept it even as prehistoric because of the suggestion of classic models found in its lineaments.

In short, chapter VIII is a tissue of error and misrepresentation; not one of the "indubitable" instances is worthy of credence; and its publication to the world as an exposition of American science is an offense to the nostrils.

Two chapters follow on "The cause of the glacial period" and "The date of the glacial period;" it is enough to say that they are of a piece with the earlier chapters.

The work ends with an appendix on "Tertiary man," by Professor Henry W. Haynes, which, albeit short and from the geologic standpoint superficial, is a silver lining to the cloud.

In brief, the introductory chapter of "Man and the glacial period" is absurdly fallacious; the chapter on existing glaciers is redeemed by quotations, but the chapter on "glacial motion" is damned by error and specious misrepresentation; the chapter on "past glaciation" is crude, unjust, egotistic and a generation behind modern science; the fifth, sixth and seventh chapters contain a large body of information which would be useful if properly arranged, but the arrangement is unscientific, unfair to American geologists, and misleading to readers; the eighth chapter purports to prove that man existed during the glacial period, but the evidence is inconclusive, and only proves, *first*, that the author is incompetent to deal with geologic phenomena, and, *second*, that his conception of geologic history is feeble and hazy; while of the concluding chapters it must

be said, tritely yet truly, that nothing that is true is new, and nothing that is new is true.

It would be charitable to allow the arraignment of the work to end here with the implication that the author in his ready acceptance of untrustworthy evidence and his apparent distortion of the views of geologists is a simple enthusiast, a gull rather than a vulture ; but it is due to scientific truth to point out evidently intentional deception on the title page. The imposing list of titles which the author appends to his name conveys the impression that he is a geologist rather than a theologian, which is misleading ; that he is a professor of geology, which is not true ; and that he is an "assistant on the United States Geological Survey," which is sheer mendacity and theft of reputation. The character of the book is indicated by the many errors and misstatements ; the character of the author must be gathered from the inherent evidence of his incompetence, the scores of misleading statements, and the apparently deliberate falsification of facts on his title page.

IV.

The two treatises have much in common ; both represent the work of the harpies by which the workshops and market-places of science are haunted ; both are misleading and pernicious, and both handicap science and hinder the progress of knowledge. Yet there are differences between them : Doughty's work is confessedly extra-scientific, or infra-scientific, and hence will receive little attention outside of the few ill-trained collectors of fantastic objects into whose hands it may fall ; while Wright's work represents a stage of science, albeit a primitive stage, and will thus find more frequent readers and work the greater injury. Again, Doughty's pamphlet is privately printed and thus bears the impress of Gilead, while Wright's book is issued by a reputable house as one of an international scientific series, whereby its maleficence is multiplied. Furthermore, Doughty's conclusions are disproved by their absurdity ; but some of Wright's conclusions are not *a priori* absurd, and their falsity can only be shown by geologists and anthropologists, whom it behooves to caution laymen and learners against the man and the book. Doughty is a simple-hearted quack whose bread-pills but tickle the fancy of weakling dupes ; Wright is a betinseled charlatan whose potions are poison. Would that science might be well rid of such harpies, especially the latter !

BOOK NOTICES.

Contributions to North American Ethnology, Volume 7. A Dakota-English Dictionary by Stephen Return Riggs. Edited by James Owen Dorsey. Washington: Govt. Printing Office. 1890 [1892].

The original "Grammar and Dictionary of the Dakota Language," collected by the members of the Dakota Mission and edited by the Rev. Stephen R. Riggs, appeared in 1852 as vol. iv of the "Smithsonian Contributions to Knowledge." It contained a grammar of 64 pages, a Dakota-English and an English-Dakota dictionary, and was, until very recently, to be regarded as the greatest work of its kind ever published.

After a lapse of forty years a new and enlarged edition of the Dakota-English part has been sent forth, and we are promised in the near future a new edition of the grammar and of the English-Dakota part. This time it is the U. S. Geological Survey that does the scientific world the service of issuing the work. It is a most valuable service too, since the edition of the old work was exhausted years ago (he who desired a copy could obtain it only through a bibliopole at an exorbitant price), and in the meantime students of the written language of the Dakotas—philologists, teachers, missionaries, educated Indians—were constantly increasing in numbers and the demand for the work was advancing.

Much of the new material in the present volume is the work of the editor of the original volume, the late Rev. S. R. Riggs; but more of it seems to have been contributed by the Rev. Messrs. Cook and Cleveland and by those worthy sons of illustrious sires, the Revs. Alfred L. and Thomas L. Riggs and the Rev. J. P. Williamson. The labors and rewards of the great Dakota Mission have been hereditary. The editorial supervision of the work has fortunately fallen to the learned care of the Rev. J. Owen Dorsey.

The new Dakota-English dictionary contains 665 pages; the old contains but 276, and both are quartos of nearly the same dimensions; but the new is not so much the more copious as might appear from these figures; it has larger type and wider margins than the other and it has but 38 lines to the column, while the old has 55.

The old edition, we are told, contains about 16,000 words, but we are not told how many the new contains. In order to arrive at some idea of the extent to which the dictionary has been increased, the writer counted in each volume the different leading words beginning with one of the following eight letters: c', g, k, p, t, u, z, and z'. These letters were selected to save labor, as the words beginning with them are few. There are 305 such words defined in the old volume and 392 in the new, an increase of 87 words, or about 28 per cent.

In examining these additional words it is surprising to find that the great majority of them are dialectic—mostly from the Teton dialect; very few seem to belong to the Dakota language in general or to the Santee (Isa₇ti), dialect which the writers of the old dictionary chiefly sought to represent. Of the 87 words referred to, only about 16 are not dialectic. This shows how thoroughly the pioneer members of the Dakota Mission did their scholarly work, and if further evidence of this were needed it might be found in the rarity of instances in which the definitions show amendment in the new volume. The dialectic additions, beginning with the eight letters referred to above, are about 71, or over 23 per cent., added to the old dictionary; but these additions are only of words used as headings and followed by definitions. Besides such, many dialectic synonyms are presented which follow the definitions and do not appear as headings. In a number of instances the dialectic word differs from the standard word only in one or two interchangeable consonants or in the addition or subtraction of the nasal *ŋ*.

It would be presumption in any one, even in one to whom the sonorous Sioux is a mother tongue, to imagine he could correct anything in this great work; yet, emboldened by the example of the school boy who differed with Webster, the writer has allowed himself to fancy that in a few instances he could improve the definitions; but he will not dare to mention all of these instances, lest confusion and shame should eventually overtake him. The following will suffice: The *Psoralea esculenta* (Pursh), the *Pomme blanche* of the French Canadians, the tipsi₇na of the Dakotas, is referred to under two headings (owobopte, tipsi₇na,) as "Dakota turnip," and under two other headings (bopta, owopte,) as "turnip." In the English-Dakota part of the earlier publication tipsi₇na is given as the Dakota equivalent for the English word turnip. This is misleading. The

Psoralea esculenta belongs to the *Leguminosæ* or Pulse family, and is far removed from the true turnip in its botanical characters. Hewáktokto is *not* the Dakota name of the Arickaree Indians. This is a point on which the reviewer has reason to believe himself specially fortified, and therefore ventures with some confidence to differ with the "Dakota-English Dictionary."

It is to be regretted that Dakota local names, which no one could so ably translate as the lamented author of this work, are not more numerous in the dictionary.

W. MATTHEWS.

Atlas der Völkerkunde. Fünfzehn Kolorierte Karten in Kupferstich mit 49 Darstellungen. Bearbeitet von Prof. Dr. Georg Gerland, Strassburg. Gotha: Justus Perthes, 1892.

This meritorious work, with its vast assemblage of details, may be called unique in its execution, though not in conception. It is an enlargement of the ethnological or seventh part of Heinrich Berghaus' "Physikalischem Atlas," and Berghaus' maps are here so thoroughly recast that even their outlines are scarcely recognizable, for modern research has made too many additions necessary.

Preliminary remarks are added in form of a preface, and their perusal is absolutely necessary for the comprehension of the maps. These are subdivided into little squares by lines drawn from east to west and by other lines intersecting them vertically, so that any name mentioned in the index can be found by consulting the squares.

One planisphere serves to represent the color of the skin in the different races, another that of the hair, of which there are two great subdivisions, straight and curly. The density of the population is very graphically represented by the increasing density of the shades. Religion, religious conceptions, endemic distempers, epidemics of the nineteenth century, dress, foods, human occupations and dwellings fill each one planisphere. Then come the races, nations, and tribes of the five parts of the world, represented on seven full-size maps, with cartoons on the margins showing tribal distribution in mountainous or other countries where the races are more mixed than in others, all of special interest to the ethnographer.

The languages of the world are represented, some by stocks, others by groups of stocks, and eleven colors are employed to show their principal elements. Six cartoons are added on the margins.

The volume closes with a racial map showing the distribution of

the national bodies at a period of from 100 to 150 years after Christ, which may serve as a linguistic map as well.

Gerland is careful in distinguishing the medley languages from the hybrid languages, some of the latter being Negro-English, Negro-French, and Chinook Jargon; and on the other side from the unmixed or comparatively unmixed tongues, as Roman, Russian, Swedish, etc. He also assumes typical groups of languages, which may enclose radically divergent languages; thus Australian is grouped with the Oceanic dialects.* Abandonment of one language to adopt another is a curious feature, examples of which are carefully recorded.

Craniology is not adopted as a means of classification by Gerland, but for the skin he assumes two main types: a fundamental *brown* one, from which darker and lighter shades have developed, and the light reddish type which we commonly call *white*.

No subdivision of the pagan religions was attempted, but if any is possible the ethnic one would be more satisfactory than any other. Some customs founded on religious ideas are mentioned, and the remarks are of great interest.

Endemic distempers are shown to be intimately connected with characteristics of soil, climate, and temperature, whereas epidemics are spreading over whole continents without restraint. Dryness and cold are unfavorable to the development of microbes, hence of sickness. Diseases almost always proceed from east to west; some are wafted about by winds, others carried about by man himself through his ubiquitous peregrinations. The two chief types of dress are the tight-fitting boreal and the tropical one, loose and thin. Our citizens' dress approximates more to the boreal type.

The racial and linguistic maps of the two Americas are of special interest to us. Gerland and others regard the Eskimos as true Americans, who once pushed their way northward and did not arrive from Asia, though in his mind America was one of the latest portions of the world to receive a human population. The Cherokees are correctly represented to be of one family with the Iroquois and Hurons, but his Koshati (for Koassáti) are wrongly placed on the Chatahoochee river. The Lipani on the Rio Grande should be spelt *Lipans*. The Towiaches were originally identical with the Wichitas and with the Towakoni, but Gerland puts all of these into four different locations, the one on Canadian River being nearly

* Classifications like these are too hazarded not to be considered as failures.

correct. The Adayes should be omitted altogether as making up a separate family, for they spoke a Pawnee or Caddoan dialect. The Tonika can be historically traced to three locations, but none were on the Gulf coast where Gerland has them. Punka is bad orthography for Ponka, and Konsas for Kansas. Paduka should be identified with Comanche, and "Füchse" (the Fox tribe) with Muskwakiuk. For transcribing foreign names Gerland has made use of Lepsius' "standard alphabet." Some curious mistakes occurred to him while doing so; e. g., he writes the Zoques of Central America (or "the hairy ones") Zokwe; the Sikaqua, Sikakwa, whereas they should be pronounced Zoke, Sikawa. His "Hiakwi" on Yaqui River is pronounced Yaki.

The specialist in ethnics and linguistics will find many other statements that will perplex him and make identification with the present tribes difficult. But as a German the professor had to contend with many difficulties which we do not experience in this country; and as one of the first modern attempts to delineate the racial stocks and reunite, in many instances, the scattered remnants of the world's nations and tribes by graphic means, the atlas before us deserves praise, and will figure as a standard work of modern research in some of its more elaborate portions. The results of Powell's investigations and those of his staff of ethnologists have been well considered.

A. S. GATSCHET.

The Land of the Cliff Dwellers. By Frederick H. Chapin. Boston: W. B. Clarke & Co. 1892. (188 pp., maps and plates.)

Notwithstanding the fact that the cliff dwellings of our Southwest have been more or less the subject of research during the last half century, the only volume devoted exclusively to them, aside from the reports on the ancient ruins in southwestern Colorado by Messrs. Holmes, Hoffman, and Jackson, of the Hayden Survey, is the one before us.

After describing the arid waste which the builders of the cliff villages occupied, the author enumerates briefly the explorations of the early Spaniards from Marcos de Niza in 1539 to Espejo in 1582, and gives a sketch of the conquest and colonization of the new-found land by Oñate and Vargas. A chapter is devoted to "Anglo-American exploration," another to "wild tribes," while a third treats of "Pueblo tribes." This portion of the volume is compiled mainly from the *relaciones* of Castañeda and other early Spanish

chroniclers, besides the writings of Bandelier, H. H. Bancroft, Winsor, Bourke, and Gregg, and in this compilation the writer's ability to separate the wheat from the chaff is well displayed. But the principal part of the work is the result of personal observation in the main and tributary valleys of the Rio San Juan. Although the volume does not claim to be a scientific treatise, the archeologist may well rejoice in the possession of a hundred pages or more of accurate description of the vestiges of an ancient pueblo culture, which vandalism threatens soon to destroy.

Many of the author's conclusions are refreshing, for he rejects the old theory that the dwellers in the cliffs were other than the ancestors of our living Pueblos. He asserts, in accordance with newly discovered evidence, that the "Montezuma" of the Pueblos is purely mythic, and that New Mexico was not discovered by Cabeza de Vaca, but by the negro Estevan under Marcos de Niza.

Accompanying the descriptive text are three maps, a dozen excellent full-page heliotype engravings, besides some fifty-five half-tone plates illustrative mainly of cliff villages or of various features of their architecture, pottery, basketry, etc., from photographs by the author. The scientific value of the work will increase with its age. As a specimen of the book-maker's art it could scarcely be excelled.

F. W. HODGE.

Bibliography of the Algonquian Languages. By James Constantine Pilling. Washington: Government Printing Office. 1891 [1892].

What book can be drier, duller, or drearier than a catalogue of books? Even when the catalogue is excellent, even when it rises to the higher level of bibliography, and on this higher plane rises to the summit of excellence, how can it be interesting? The street directory is a most useful book, and so is the dictionary, and the gazetteer; but is it not a strain on the imagination to call these books interesting? They may be likened to our ticket agents at the transfer stations, to whom we hurriedly go in rain or shine or cold or wet and from whom we unconsciously expect instant and perfect attention to duty, and only become conscious of the man in the rare instances when the usual routine duty is not instantly and perfectly done. The bibliographer is our transfer man, and when he does his work thoroughly, completely, and unceasingly we are hardly conscious of his existence.

For more than twelve years the Bureau of Ethnology has had its

faithful transfer man unceasingly on duty. He is its bibliographer, and his name is James Constantine Pilling, the sixth of whose excellent bibliographies on Indian languages has recently appeared.

Beginning in 1879 with the preparation of a list of books giving information about Indian languages, the work grew and grew, and finally, in 1885, a fat quarto volume of 1,200 pages, the "Proof-Sheets of a Bibliography," was born. Had this been the end of the work begun six years before, it would still have been a worthy end. But it was not the end; it was rather the finish of but one chapter, the preparation and completion of which pointed the way to other and better chapters. The world gained a prosy but very useful document, and Mr. Pilling and the Bureau of Ethnology gained a valuable experience, which clearly pointed the way to a still more useful work, upon which he promptly entered.

The new work was classification and separate publication. When the work of collecting was begun nobody could guess how big a pile would be gathered. The publication of an unwieldy quarto and the quantity of material which flowed in after printing began showed clearly that classification must be begun. It was thereupon decided that a series of bibliographies should be prepared. Each one was to consist of a list, as complete as possible, of all the books, papers, manuscripts, magazine articles, reviews, etc., ever known or heard of, containing information about the language of some one group of North American Indians whose language was the same or simply variants or varieties of the same—in the language of the anthropologist, one linguistic stock. Now, there are fifty-seven such stocks, and the Algonquian bibliography before us is the fifth one that has been compiled by Mr. Pilling and published by the Bureau of Ethnology.

It is the largest and in some respects the most important of the series. It deals with those Indians with whom the whites were first and longest in contact and who dwelt in the regions now so thickly settled by the whites. If one would know the meanings of the Indian words scattered over all the northeastern and northern middle United States and around the Great Lakes and in Canada, here he will find the key to the literature. If he cares not for Indians or their language, he will find interesting details about early printing in New England and nearly a hundred fac-simile reproductions of title-pages of curious and rare old pamphlets and books in the rugged and forbidding gutturals of New England Indians; and even if book-making does not interest him, he can see here concrete illustrations of the grim religious views of our forefathers, and how de-

voted they were to the saving of red men's souls. Thanks to their zeal in this, they learned the Indian's language, manners, and customs, translated the Bible into his language, wrote pious primers and sermons in his tongue, and so unintentionally gathered and preserved material which the scholar can now use in formulating the laws of man's progress from savagery onward and upward through barbarism to civilization.

The 82 fac-simile title-pages scattered through this 600-page book are full of instruction. For the antiquary they are more, they are interesting. The writer who would make a good title-page can here find numerous examples—*not* to be followed. Witness the fac-similes of the title-pages of Adriaen van der Donck's Description of New Netherland, with its seal containing the frightful and frightened mammal that may pass for cat, fox, porcupine, or — ?

The book called *The Hatchets*, printed at Boston in 1705, solves the title-page problem by having none at all ; but beginning without it or dedication or introduction or preface or contents or anything, we have page 1, and without head-lines :

The Hatchets, to hew down the Tree of Sin,
which bears the Fruit of Death.

OR,

The LAWS, by which the Magistrates are
to punish Offences, among the *Indians*,
as well as among the *English*.

The writings of apostle John Eliot naturally occupy a conspicuous place in the work. These pious books, the outcome of a burning zeal to save pagan souls, have in our time become exceeding scarce and are eagerly sought and prized. Of the 1,000 copies constituting the first edition (1661-'63) of Eliot's Indian Bible and the 2,000 copies constituting the second edition (1680-'85), perhaps 100 more or less complete copies have 'survived two centuries. Mr. Pilling, who has pursued these bibles with an ardor only equalled by that of the apostle himself, has succeeded in discovering the location and history of 39 of the first edition and 55 of the second, a total of 94 copies. Of each of these 94 copies minute and detailed description is given, ending with the statement that "Further research will bring to light many more copies of the Indian bible." When we run over the prices paid in recent years for copies of these books, prices varying from \$50 to \$3,000, we may be pardoned for a little skepticism about the *many* yet to be revealed. Many Indian bibles were lost or destroyed during the Indian war of 1675-'76, and

this destruction became the incentive for a second edition. Eliot's Indian converts, called "praying Indians," like modern Indians, made known their wants, and the old man, full of zeal for the cause to which he had devoted his entire life, set about preparing for a new edition of the whole bible. Whatever may be said of his arguments, his zeal won—a zeal which wholly hid from him the humor of the statement that "thousands of souls, some true believers, some learners, and some still infants, all of them beg, cry, entreat for bibles, having already enjoyed that blessing, but now are in great want." In 1685, when nearly 80 years old, the venerable apostle saw the new edition of 2,000 copies completed.

Use of the Eliot bible ceased about the middle of the last century, and it is said but one man now living *can* and no man *does* read it. Yet it is a very poor specimen of an Eliot bible that will not sell for \$250. Thus we see this book utterly neglected for the purposes intended by its author, but eagerly sought for quite other purposes. It is not unique in this respect, and suggests a theme for those who think great libraries should keep useful books only, destroying the worthless trash.

No less than 57 pages of this elaborate bibliography are devoted to Eliot's writings, and so completely and fully is the field worked over and the golden grain extracted that even patient John Chinaman would starve over the tailings.

Of the 1,926 titles of printed articles embraced in this bibliography the compiler has seen and described from personal inspection 1,850, or 96 per cent. Of the remaining 4 per cent. quite a number no longer exist. Similarly Mr. Pilling has described from personal inspection 184 of the 319 manuscripts embraced in the list, or 57 per cent. Dealing with rare, old, choice, and highly prized books, access to which is sedulously guarded, has perhaps led to the printing of a few copies of this book as an edition de luxe on fine paper and with broad margins. It is only in this style of imprint that the beautiful fac-similes can be seen to their full advantage.

The bibliographies which have preceded this relate to the Eskimauan, Siouan, Iroquoian, and Muskhogean stocks, and the next following one relates to the Athapascan languages. Still others are in preparation, and it is earnestly to be hoped that the compiler, who in impaired health has lost neither heart nor interest in this laborious work, may be long spared to continue it and to realize his dream of a "Bibliography of the Indian Languages of North America."

MARCUS BAKER.

Bibliography of the Athapaskan Languages. By James Constantine Pilling. Washington: Government Printing Office. 1892.

Of the Tinnéh or Athapaskan tribes of North America, Hubert Howe Bancroft tells us that they are "A people whose diffusion is only equalled by that of the Aryan or Semitic nations of the old world. The dialects of the Tinnéh language are by no means confined within the limits of the Hyperborean division. Stretching from the northern interior of Alaska down into Sonora and Chihuahua, we have here a linguistic line of more than four thousand miles in length, extending diagonally over forty-two degrees of latitude, like a great tree whose trunk is the Rocky Mountain range, whose roots encompass the deserts of Arizona and New Mexico, and whose branches touch the borders of Hudson Bay and of the Arctic and Pacific oceans."¹ They form, too, a people long known to the Europeans. There are few families of American tribes existing to-day who were known to us at an earlier date than the Athapaskan family.

Notwithstanding the wide diffusion of this stock, the bibliography of its languages does not seem copious when compared with the bibliographies of the languages of the more narrowly limited Eskimo, Siouan, Iroquoian, Muskogean, and Algonquian families. The work now under consideration is the sixth, in order of issue, of the valuable bibliographies of American linguistic families which Mr. Pilling has compiled. The bibliographic lists proper of these six volumes contain the following numbers of pages: Eskimo, 109; Siouan, 82; Iroquoian, 180; Muskogean, 103; Algonquian, 549; Athapaskan, 115. The Athapaskan is thus represented to a degree comparatively meager, considering its wide diffusion, chiefly for the reason that tribes of this stock dwell in remote parts of our continent, where missionaries and others of scholarly bent have rarely penetrated until within recent years.

This volume is prepared throughout with the same scrupulous and intelligent care which has characterized all the previous efforts of its author and in accordance with the most approved recent models of bibliographic work. In additions to titles and descriptions of books in over forty different languages and dialects, there appear four fac-similes and about forty biographies, nearly half of which

¹ *Native Races of the Pacific States*, vol. iii, p. 583.

are published here for the first time. The work records all the titles that could be found, with most painstaking research, in Anglo-American libraries and collections, public and private, and in the library of the British Museum. It is not improbable that Spanish-American collections might yield something more if examined.

A chronological index occupies the last nine pages of the book. The first entry in the index bears the date of 1744. Four authors are mentioned as having placed on record something of the Athapascan tongues in the 18th century, but all these authors studied the languages of the far north. For two centuries before they wrote the Spaniards and their descendants had been listening to the tongues of the far south. It is generally conceded by students of the Pueblo and Athapascan languages in the Southwest that the name *Tusayan*, which Coronado applied to the Moki country in 1541, is of Navajo origin. It would be strange if in those two hundred years the Spanish missionaries and explorers had made no further record of these tongues.

Mr. Pilling tells us in his preface (p. 6) that "The present volume embraces 544 titular entries, of which 428 relate to printed books and articles and 116 to manuscripts. Of these 517 have been seen and described by the compiler, 422 of the prints and 95 of the manuscripts, leaving 27 as derived from outside sources, 16 of the prints and 21 manuscripts." We quote the above for two reasons: first, to give the reader a better idea than we have heretofore given of the scope of the work, and, second, to point out the only error that we have discovered in the book. $16 + 21 = 37$, not 27; for 16 read 6.

W. MATTHEWS.

Some Strange Corners of Our Country. By Charles F. Lummis.
New York: The Century Company. 1892. Pp. xi-270, illustrations. 12°.

The "strange corners" from which Mr. Lummis has brought to light a score of interesting and hitherto almost unknown facts is the great Southwest, a veritable wonderland to the tourist and ethnologist alike. The stories which the author relates were gleaned during several years' residence in Arizona and New Mexico, especially in the Indian pueblo of Isleta on the Rio Grande, where unusual facilities were afforded for studying the less-known customs of the Tiguas.

These strange corners are described in a felicitous vein, and details such as can be given only after careful research are faithfully and accurately, though simply, portrayed in a manner that all may read and learn, and many become dispossessed of the popular fallacies regarding this little-known region. The Moki snake dance is described and a chapter is devoted to the Navajo hunting custom of "begging the bear's pardon." Under the title "The witches' corner" some interesting facts are given concerning the practice of sorcery by the Mexicans as well as by the Pueblos. The Pueblo "magicians" or medicine-men (the *brujos* and *hechiceros* of old Mexican annals), who perform many wonderful feats of legerdemain, and the "self-crucifiers," or so-called Penitent Brothers, who still practice the barbaric custom of crucifixion as a means of penance, are given a place in the book. "Homes that were forts" (referring to the former cliff-houses of the Pueblos), "Montezuma's well," and "Montezuma's castle" are chapters of special interest to the archeologist.

One of the greatest of all the wonders of the Southwest is the "Stone Autograph Album"—*El Morro* of the Spaniards and the Inscription Rock of our times. On the massive face of this great rock "castle" west of Zuffi were carved the autographs of Ofiate in 1605, Vargas in 1692, and later of the Hurtados, Nieto, Lujan, and others who pressed forward to Zuffi, bearing both cross and sword. Fac-similes of these inscriptions, with interlinear and free translations, are given.

The recent lava flows of central New Mexico are described under the caption "The rivers of stone," and the description of the process of weaving the famous Navajo blanket is illustrated by a colored plate of the finished fabric. "The blind hunters" are the animal fetiches of the Pueblo and Navajo used in the chase, and "Finishing an Indian boy" is the title of a chapter on the long and arduous life ceremony undergone in making a medicine-man. "The praying smoke" is the sacred Pueblo cigarette, which more than performs the duties of the better-known calumet, and the "Dance of the sacred bark" refers here to the sacred scalp dance of the Village Indians, for the first time described. An account is given of the Pueblo method of "doctoring the year," and space is found for a word on the home life of the Isletaños. In fact, the volume is brimful of interesting things by which all may profit. It is abundantly illustrated.

F. W. HODGE.

A QUARTERLY BIBLIOGRAPHY

OF

ANTHROPOLOGIC LITERATURE.

COMPILED BY ROBERT FLETCHER, M. D.

- Abbott** (C. C.) Recent archæological explorations in the valley of the Delaware. Boston, 1892, Ginn & Co., 2 + 30 p. 8°. [Univ. of Pa., ser. in philol., lit. & archæol.]
- Batchelor** (*Rev. J.*) The Ainu of Japan: the religion, superstitions and general history of the hairy aborigines of Japan. N. Y. & Chicago [1892], Fleming H. Revell Co., 6-336 p.
- Beddard** (Frank E.) Animal coloration. New York, 1892, Macmillan & Co., 288 p.
- Chapin** (Frederick H.) The land of the Cliff Dwellers. Boston, 1892, W. B. Clarke & Co., 188 p., maps & pls. 12°.
- Coulon** (Raimond). Synthèse du transformisme. Description élémentaire de l'évolution universelle. Par., 1892, C. Reinwald, 229 p. 8°.
- Desnoyers**. État des études archéologiques dans le département du Loiret, mémoire lu, dans la séance d'ouverture du Congrès archéologique de France du 21 juin 1892. Orléans, 1892, Jacob, 16 p. 8°.
- Le préhistorique dans l'Orléanais, mémoire lu, dans la séance du Congrès archéologique de France du 26 juin 1892. Orléans, 1892, Jacob, 13 p. 8°.
- Galton** (Francis). Finger prints. London & N. Y., 1892, Macmillan & Co., xvi, 216 p., 15 pl. 8°.
- Garner** (R. L.) The speech of monkeys. Lond., 1892, W. Heinemann, 275 p. 12°.
- Lombroso** (Cesare). Les applications de l'anthropologie criminelle. Paris, 1892, F. Alcan, 224 p. 12°.
- Lummis** (Charles F.) Some strange corners of our country, the wonderland of the southwest. New York, 1892, Century Co., xi, 270 p. 12°.
- Parker** (T. Jeffery). Lessons in elementary biology. London & N. Y., 1892, Macmillan & Co., 408 p.
- Patologia** (La) del genio e gli scienziati italiani inchiesta a proposito del caso di Guy de Maupassant promesso e ordinata da A. G. Bianchi, colle risposte originali di Cesare Lombroso [et al.]. Milano, 1892, M. Kantorowicz, 88 p. 8°.
- Pitt Rivers** (*Lieut.-Gen.*) Excavations in Bokerly and Wansdyke, Dorset and Wilts. 1881-91. With observations on the human remains by J. G. Garson, M. D. Vol. III. [London,] 1892, Printed privately, xvi-308 p., maps and pls. 4°.
- Pokrowski** (E. A.) [Games of Russian children.] Moskva, 1892, M. Volchaninoff, ii, iv, 5-128 p. 8°.
- Proctor** (Edna Dean). The song of the ancient people. With Preface and Notes by John Fiske and Commentary by F. H. Cushing. Boston and New York, 1893 [1892], Houghton, Mifflin & Co., xvii, 69 p. 8°.
- de Quatrefages** (A.) Darwin et ses précurseurs français. Étude sur le transformisme. Paris, 1892, F. Alcan, 294 p. 8°.

- Ranke** (Johannes). Beiträge zur physischen Anthropologie der Bayern. II. Band ueber einige gesetzmässige Beziehungen zwischen Schädelgrund, Gehirn und Gesichtsschädel. Zugleich als Leitfaden für kranio-metrische Vermessungen nach der deutschen Methode. München, 1892, F. Bassermann, 132 p., 30 pl. 8°.
- Reuleaux** (F.). Technology and civilization. Washington, 1891 [1892], Govt. Print. Office, 704-719 p. 8°.
- Sciences** (Les) biologiques à la fin du xix^e siècle, médecine, hygiène, anthropologie, sciences naturelles, etc., publiés sous la direction de MM. R. Blanchard, Charcot, Leon Colin [et al.]. Paris, 1893, 800 p. 8°.
- Sighele** (Scipio). La foule criminelle. Essai de psychologie collective. Traduit de l'italien par Paul Vigny. Paris, 1892, F. Alcan, 192 p. 12°.
- Snyder** (J. F.). Primitive urn burial. Washington, 1891 [1892], Govt. Print. Office, 1-610-613 p. 8°.
- Souffret** (François). De la disparité physique et mentale des races humaines et de ses principes. Paris, 1892, F. Alcan, 322 p. 8°.
- Sprague** (Rev. F. M.). Socialism from Genesis to Revelation. Boston, 1893 [1892], Lee & Shepard, 22-493 p. 12°.
- Virchow** (Rudolf). Crania ethnica americana. Sammlung auserlesener americanischen Schädeltypen. Berl., 1892, A. Ascher & Co., 33 p., 26 pl., 26 l. fol.
- Wright** (G. F.). Man and the glacial period; with an appendix on tertiary man by H. W. Haynes. N. Y., 1892, D. Appleton & Co., 13 + 385 p. [Internat. Scient. Ser.]
- Abbott** (C. C.). Palæolithic man in North America. Science, N. Y., 1892, xx, 270.—**Allison** (H. E.). On motives which govern the criminal acts of the insane. Am. J. Insan., Utica, N. Y., 1892-3, xlix, 192-205.—**Aubry** (P.). Une famille de criminels; note pour servir à l'histoire de l'hérédité. Ann. méd.-psych.; Par., 1892, 7. s., xvi, 429-441.—**Audibert** (A.). De la condition des fous et des prodiges en droit romain et de l'influence que la science médicale a exercée en ces matières sur l'évolution du droit. Arch. de l'anthrop. crim., Par., 1892, vii, 593-608.—**Bancalari** (G.). Vorgang bei der Hausforschung. Mitth. d. anthrop. Gesellsch. in Wien, 1892, xxii [57-67].—**von Bardeleben** (K.). Ueber 600 neue Fälle von Hyperthelie bei Männern. Verhandl. d. anat. Gesellsch., Jena, 1892, vi, 199-202.—**Barot** (L.). Un hivernage dans la Chine du Nord (1890-1891), notes de géographie et d'ethnographie médicales. Arch. de méd. nav., Par., 1892, lviii, 241; 342.—**Bartels**. Ein junger Mann mit abnormer Behaarung. Verhandl. d. Berl. Gesellsch. f. Anthrop., Berl., 1892, 215. — 17 jährige Zigeunerfrau mit einem grossen Pigmentmal. *Ibid.*, 215.—**Beauchamp** (W. M.). Iroquois notes. J. Am. Folk-Lore, Bost. & N. Y., 1892, v, 223-229.—**Benedikt** (M.). Les suggestions criminelles et la responsabilité pénale. Arch. de l'anthrop. crim., Par., 1892, vii, 555-557.—**Berard** (A.). Les hommes et les théories de l'anarchie. *Ibid.*, 609-636.—**Bertrand** (A.). Cours municipal de sociologie. *Ibid.*, 656-678.—**Boule** (M.). Une excursion dans le quaternaire du nord de la France. Anthropologie, Par., 1892, iii, 426-434.—**Brazier**. La lutte pour la vie suivant les doctrines transformistes. Sciences biol. xix siècle, Par., 1893, 264; 337; 464.—**Brewster** (C. E.). The symmetrical development of our young women. Pop. Sc. Month., N. Y., 1892-3, xlii, 217-223.—**Brinton** (D. G.). Reminiscences of Pennsylvania folk-lore. J. Am. Folk-Lore, Bost. & N. Y., 1892, v, 177-185.—**Brown-Sequard**. Hérité d'une affection due à une cause accidentelle; faits et arguments contre les explications et les critiques de Weismann. Arch. de physiol. norm. et path., Par., 1892, 5. s., iv, 686-688.—**Browne** (Sir J. C.). Sex in education. Tr. M. Soc. Lond., 1891-2, xv, 405-436.—**Carrara** (M.). Di alcune anomalie scheletriche nei criminali. Gior. d. r. Accad. di med. di Torino, 1892, 3. s., xl, 549-563.—**Cartailhao** (E.). L'âge de la pierre en Afrique. Anthropologie, Par., 1892,

- iii, 405-425.—**Charrin et Gley.** De l'hérédité. *Compt. rend. Soc. de biol.*, Par., 1892, 9. s., iv, 818.—**Collignon (R.)** Les races tunisiennes. *Sciences biol.* à la fin du xix^e siècle, Par., 1893, 128-139.—**Carrier (A. F.)** A study relative to the functions of the reproductive apparatus in American Indian women. *Tr. Am. Gynec. Soc.*, Phila., 1891, xvi, 264-294.—**Cushing (F. H.)** Manual concepts: a study of the influence of hand-usage on culture-growth. *Am. Anthrop.*, Wash., 1892, v, 289-317, 1 pl.—**Debierre (C.)** Valeur de la fossette occipitale moyenne en anthropologie. *Compt. rend. Soc. de biol.*, Par., 1892, 9. s., iv, 787-792.—**Discussion** sur les cagots des Pyrénées et la lèpre. *Bull. Acad. de méd.*, Par., 1892, 3. s., xxviii, 626-644.—**Dixon (W. A.)** The morbid proclivities and retrogressive tendencies in the offspring of mulattoes. *Med. News*, Phila., 1892, lxi, 180-182.—**Donati (G.)** Una tavoletta augurale indiana. *Arch. per l'anthrop.*, Firenze, 1892, xxii, 149-152, 1 pl.—**Drake-Brockman (H. E.)** Remarkable cases of polydactylism. *Brit. M. J.*, Lond., 1892, ii, 1167.—**Dwight (T.)** Fossa prænasalis. [Transl. from: *Am. J. M. Sc.*, Phila., 1892.] *Arch. f. Anthrop.*, Brnschw., 1892-3, xxi, 247-252.—**Ellis (H.)** The place of anthropology in medical education. *Lancet*, Lond., 1892, ii, 365.—**Excursion** à Saumur et à Tours. *Rev. mens. de l'École d'anthrop.* de Par., 1892, ii, 339-343, 1 pl.—**Fere (C.) et P. Battigne.** Note sur les empreintes de la pulpe des doigts et des orteils. *Compt. rend. Soc. de biol.*, Par., 1892, 9. s., iv, 802-806.—**Ferrero (G.)** L'atavisme de la prostitution. *Rev. scient.*, Par., 1892, i, 136-141.—**Fewkes (J. W.)** and **A. M. Stephens.** The Na-âc-nai-ya: a Tusayan initiation ceremony. *J. Am. Folk-Lore*, Bost. & N. Y., 1892, v, 189-217.—**Fiske (W. M.)** The regulation of marriage by law. *N. Am. J. Homœop.*, N. Y., 1892, 3. s., vii, 705-713.—**Fortunatoff (A. M.)** [On hereditary ectrodactylia in man.] *Protok. zasaid. Russk. antrop. Obsh.*, St. Petersburg, 1892, iii, 61-64.—**Foshay (P. M.)** The fertility of hybrids. *Med. News*, Phila., 1892, lxi, 418.—**Frigerio.** Atrofia dell'emisfero destro in un pazzo criminale mancino. *Raccoglitore med.*, Forlì, 1892, 5. s., xiv, 61-66.—**Gauokler (E.)** De l'importance respective des éléments sociaux et des éléments anthropologiques dans la détermination de la pénalité. *Arch. de l'anthrop. crim.*, Par., 1892, vii, 523-530.—**Giacomini (C.)** Annotations sur l'anatomie du nègre. [Transl. from: *Gior. d. r. Accad. di med.* di Torino, 1892, 3. s., xl.] *Arch. ital. de biol.*, Turin, 1892, xvii, 337-371, 1 pl.—**Gilchenko (N. V.)** [Anthropological sketch of the Ossetes.] *Protok. zasaid. Russk. antrop. Obsh.*, St. Petersburg, 1892, iii, 11-26. — [Contributions to anthropology of the Caucasus. *Tersko Cossacks.*] *Ibid.*, 109-117.—**Graff (H.)** Den norske Races fysiske Degeneration i Nordamerika. *Norsk Mag. f. Lægevidensk.*, Christiania, 1892, 4. R., vii, 818-821.—**Graham (J. T.)** The criminal insane. *Med.-Leg. J.*, N. Y., 1892-3, x, 202-206.—**Gurrieri (R.)** Sensibilità e anomalie fisiche e psichiche nella donna normale e nella prostituta. *Arch. di psichiat.*, etc., Torino, 1892, xiii, 328-347.—**Hart (F. L.)** Supernumerary mamma and nipple. *Brit. M. J.*, Lond., 1892, ii, 1054.—**Hartmann (A.)** Becherstatuen in Ostpreussen und die Literatur der Becherstatuen. *Arch. f. Anthrop.*, Brnschw., 1892-3, xxi, 253-303, 1 pl.—**Hepburn (D.)** The integumentary grooves on the palm of the hand and sole of the foot of the man and the anthropoid apes. *J. Anat. & Physiol.*, Lond., 1892-3, xxvii, 112-130.—**Hoernes (M.)** Die ornamentale Verwendung der Thiergestalt in der prähistorischen Kunst. *Mitth. d. anthrop. Gesellsch.* in Wien, 1892, xxii, 107-118.—**Holder (A. B.)** Diseases among Indians. *Med. Rec.*, N. Y., 1892, xlii, 329; 357.—**House (E.)** et **L. Warnots.** Existe-t-il type de criminel anatomiquement déterminé? *Arch. de l'anthrop. crim.*, Par., 1892, vii, 547-555.—**Hovelacque (A.)** et **G. Herve.** Crânes de l'Aveyron. *Rev. mens. de l'École d'anthrop.* de Par., 1892, ii, 262-268. — Crânes de Saint-Jean de Sagondignac en Médoc. *Ibid.*, 330-332.—**Jacob (G.)** Ueber eine Eisenfigur in der Sammlung des Henneberg alterthumsforschenden.

Vereins zu Meiningen. Arch. f. Anthrop., Brnschw., 1892-3, xxi, 209-214, 1 pl.—**Jadrinsoff** (N. M.) [The nomadic life of nations and its relation to history of human culture.] Protok. zased. Russk. antrop. Obsh., St. Petersburg., 1892, iii, 64-69.—**Jeans** (J.) The doom of the Katt-a-quins. J. Am. Folk-Lore, Bost. & N. Y., 1892, v, 232-235.—**Kirilloff** (N. V.) [Present importance of Tibethian medicine, as part of the doctrines of Lama. Vestnik obsh. hig., sudeb. i prakt. med., St. Petersburg., 1892, xv, pt. 1, 18; 95, 2 tab. Also, Reprint.—**Kuborn** (H.) Des progrès de la diffusion de l'instruction publique en Belgique, au point de vue de la criminalité et de l'aliénation mentale. Tr. vii Internat. Cong. Hyg. & Demog., 1891, Lond., 1892, iv, 137-146.—**Laurent** (É.) Les maladies de la volonté chez les criminels. Ann. méd.-psych., Par., 1892, 7. s., xvi, 404-428. — L'anthropologie criminelle en 1889. Science biol. à la fin du xix^e siècle, Par., 1893, 511; 533.—**Leland** (C. G.) The folk-lore of straw. J. Am. Folk-Lore, Bost. & N. Y., 1892, v, 186-188.—**von Liszt** (F.) Aperçu des applications de l'anthropologie criminelle. Arch. l'anthrop. crim., Par., 1892, vii, 530-538.—**Loewe** (K.) Ueber Ruminatio humana. München. med. Wehnschr., 1892, xxxix, 474.—**Lombroso** (C.) Quattro cranii di assassini Ravennati. Gior. d. r. Accad. di med. di Torino, 1892, 3. s., xl, 772-774. — Applicazioni pratiche dell' antropologia criminale. Scuola positiva, Napoli, 1892, ii, 353-365.—**Lombroso** (C.) e **Monguidi**. Scopertura del canale sacrale in delinquenti. Gior. d. r. Accad. di med. di Torino, 1892, 3. s., xl, 771.—**Low** (B.) The natives of Borneo; edited from the papers of the late Brooke Low, Esq., by H. Leing Roth. J. Anthrop. Inst., Lond., 1891-2, xxi, 110.—**McVey** (B.) Negro practice. N. Ori. M. & S. J., 1892-3, n. s., xx, 328-332.—**MacDonald** (A.) Observations pour servir à l'étude de la sexualité pathologique et criminelle. [Transl. from the English.] Arch. de l'anthrop. crim., Par., 1892, vii, 637-655.—**Magitot**. Sur une variété de cagots des Pyrénées. Bull. Acad. de méd., Par., 1892, 3. s., xxviii, 589-

600.—**Makowsky** (A.) Der diluviale Mensch im Löss von Brünn; mit Funden aus der Mammuthzeit. Mitth. d. anthrop. Gesellsch. in Wien, 1892, n. F., xii, 73-84, 3 pl.—**Manouvrier** (L.) Questions préalables dans l'étude comparative des criminels et des honnêtes gens. Rev. mens. de l'École d'anthrop. de Par., 1892, ii, 277-290. Also, Arch. de l'anthrop. crim., Par., 1892, vii, 557-574.—**Marsh** (E. J.) Longevity. Tr. M. Soc. N. Jersey, Newark, 1892, 83-117.—**Marshall** (J.) On the brain of the late George Grote, F. R. S., with comments and observations on the human brain and its parts generally. J. Anat. & Physiol., Lond., 1892-3, xxvii, 21-68.—**Meringer** (R.) Studien zur germanischen Volkskunde. Mitth. d. anthrop. Gesellsch. in Wien, 1892, xxii, 101-106.—**Mingazzini** (G.) Osservazioni intorno alla scafocefalia. Bull. d. r. Accad. med. di Roma, 1891-2, xviii, 272-287.—**Morasso** (M. P.) Esame critico delle dottrine filosofiche e criminalologiche di G. Farde. Scuola positiva, Napoli, 1892, ii, 119-160.—**Morris** (C.) The origin of lungs, a chapter in evolution. Am. Naturalist, Phila., 1892, xxvi, 975-986.—**Morrison** (Rev. W. D.) The study of crime. Mind, Lond. & Edinb., 1892, n. s., i, 489-517.—**de Mortillet** (A.) Évolution de la hache en bronze en Italie. Rev. mens. de l'École d'anthrop. de Par., 1892, ii, 313-329.—**Moschen** (L.) Due scheletri di Melanesi. Bull. d. r. Accad. med. di Roma, 1891-2, xviii, 288-295.—**Niederle** (L.) Die Schädel von Senftenberg. Mitth. d. anthrop. Gesellsch. in Wien, 1892, xxii, [82-85].—**Nonne** (M.) Zwei Fälle von Pseudo-Hermaphroditismus masculinus bei zwei Geschwistern. Jahrb. d. Hamb. Staatskrankenanst., 1890, Leipzig., 1892, ii, 446-450, 2 pl.—**Olshausen**. Leichenverbrennung. Verhandl. d. Berl. Gesellsch. f. Anthrop., Berl., 1892, 129-177.—**Ottolenghi** (S.) La donna delinquente in rapporto alla psichiatria forense. Gazz. med. di Torino, 1892, xliii, 541; 581; 621.—**Ottolenghi** (S.) and **M. Carrara**. Il piede prensile negli alienati e nei delinquenti. Arch. di psichiat., etc., Torino, 1892, xiii, 373-381.—

- Pantjuchoff** (I. I.) [The district of Akhalkalak. Medico-anthropological sketch.] *Med. Sbornik*, Tiflis, 1892, 127-215.—**Pasquarelli** (M.) Inchiesta psicologica attraverso i proverbi; pagina di psicologia di un Pæsi di Basilicata. *Anomalo*, Napoli, 1892, iv, 22; 80; 120; 149; 184; 228.—**Pinto** (J. O.) On identity and the means of identification. *Indian M. Rec.*, Calcutta, 1892, iii, 1.—**Pommerol** (F.) Le squelette humain de Gravenoire. *Rev. mens. de l'École d'anthrop. de Par.*, 1892, ii, 269-272.—**Prendergast** (L.) The development of the reformatory and industrial school system in England. *Tr. vii. Internat. Cong. Hyg. & Demog.*, 1891, Lond., 1892, iv, 146-170.—**Putjatin** (P. A.) [Fauna of the stone age as found in excavations in vicinity of Bologoff from a paleo-ethnological point of view.] *Protok. zasaid. Russk. antrop. Obsh.*, St. Petersburg, 1892, iii, 86-109.—**Reber** (B.) Die vorhistorischen Denkmäler in Einfischthal (Wallis). *Arch. f. Anthrop.*, Brnschw., 1892-3, xxi, 305-320, 5 pl.—**Reich** (E.) Die Einheit des Menschen und der innere Zusammenhang von Anthropologie, Hygiene und Socialwissenschaft. *Athenæum d. Gegenwart*, München, 1892, 1-5.—**Richet** (C.) L'alimentation et le luxe; réponse à L. Tolstol. *Rev. scient.*, Par., 1892, l, 385-391.—**Rosenbaum** (A.) and **G. Skudro**. Der Malthusianismus und seine Folgen. (Eine medicinisch-sociologische Studie.) *Wien med. Presse*, 1892, xxxiii, 1055; 1097; 1139; 1177.—**Rouby**. Les aliénés persécuteurs dans l'histoire; Ravaillac. *Arch. de l'anthrop. crim.*, Par., 1892, vii, 191; 404.—**Roussel** (T.) L'enfant à tendances criminelles ou placé dans un milieu criminel. *Tr. vii. Internat. Cong. Hyg. & Demog.*, 1891, Lond., 1892, iv, 170-175.—**Sabatier** (A.) The synthesis of living beings. [*Transl. from: Rev. scient.*, Par.] *Pop. Sc. Month.*, N. Y., 1892-3, xlii, 49-57.—**Schleicher** (W.) Contribution à l'étude des sépultures au point de vue hygiénique; caveaux et galeries funéraires, par Th. Belval. [*Rap.*] *Bull. Soc. de méd. d'Anvers*, 1892, liv, 205.—**Schrader** (F.) La Chine. *Rev. mens. de l'École d'anthrop. de Par.*, 1892, ii, 177-190.—**Schrove** (C. F.) Een geval van brachygnathie bij een pasgeboren Kind. *Nederl. Tijdschr. v. Verlosk. en Gynæc.*, Haarlem, 1892, iv, 29-38, 3 pl.—**Schwartz** (W.) Mythologische Bezüge zwischen Semiten und Indogermanen. (Mit einem Excurs über die Stifshütte.) *Ztschr. f. Ethnol.*, Berl., 1892, xxiv, 157-176.—**Sergi** (G.) Melanesia e Melanesiani. *Bull. d. r. Accad. med. di Roma*, 1891-2, xviii, 92-176.—**Shattinger** (C.) Ruminations in man. *Med. Fortnightly*, St. Louis, 1892, ii, 167-171.—**Shufeldt** (R. W.) A comparative study of some Indian homes. *Pop. Sc. Month.*, N. York, 1892, xli, 798-810.—**Sillio y Cortes** (C.) La criminalità nella Spagna. *Scuola positiva*, Napoli, 1892, ii, 161-167.—**Siret** (L.) Nouvelle campagne de recherches archéologiques en Espagne; la fin de l'époque néolithique. *Anthropologie*, Par., 1892, iii, 385-404.—**Somers** (A. N.) Prehistoric cannibalism in America. *Pop. Sc. Month.*, N. Y., 1892-3, xlii, 203-207.—**Stephenson** (P. B. T.) Notes on physique. The black and coolie races. *Brit. Guiana M. Ann.*, Demerara, 1892, 121-126, 4 ch.—**Stevens** (G. F.) L'influence de l'état des muscles moteurs de l'œil sur l'expression du visage. [*Transl.*] *Ann. d'ocul.*, Par., 1892, cviii, 241-259.—**Straub**. Samoa, Ugi (Salomons-Ins.) neu-Britannien, Admiralitäts-Inseln. *Verhandl. d. Berl. Gesellsch. f. Anthrop.*, Berl., 1892, 220-231, 1 pl.—**Struthers** (J.) On the articular processes of the vertebrae in the gorilla compared with those in man, and on costo-vertebral variation in the gorilla. *J. Anat. & Physiol.*, Lond., 1892-3, xxvii, 131-138.—**Susuki** (B.) Honjobin no roso ni Zukete. [On the brain weight of the Japanese.] *Ztschr. d. Tokio med. Gesellsch.*, 1892, vi, 11, 14-17.—**Svoboda** (W.) Die Bewohner des Nikobaren-Archipels, nach eigenen Beobachtungen, älteren und neueren Quellen. *Internat. Arch. f. Ethnog.*, Leiden, 1892, v, 149-168, 2 pl.—**Talko-Gryncewicz** (J.) [On the anthropology of the Ukrainian and Letton Hebrews.] *Protok. zasaid. Russk. antrop. Obsh.*, St. Petersburg, 1892, iii, 71-86.—**von Torok** (A.) Die geometrischen Principien der elementaren

Schädelmessungen und die heutigen kranimetrischen Systeme. Internat. Monatschr. f. Anat. u. Physiol., Leipz., 1892, ix, 297-384, 1 pl. — Neuere Beiträge zur Frage der Horizontalebene des Schädels in Bezug auf die kranimetrische Analyse der Schädelform. Mitth. d. anthrop. Gesellsch. in Wien, 1892, n. F., xii, 85-100. — **de Tolosa-Latour** (M.) Nécéssité des études anthropologiques et anthropométriques dans la première enfance, la jeunesse, la vie de l'école et l'âge adulte. Tr. vii. Internat. Cong. Hyg. & Demog., 1891, Lond., 1892, iv, 254-265. — **Tolstoi** (L.) Notre alimentation. [Transl.] Rev. scient., Par., 1892, I, 225-326. — **Topinard** (P.) L'anthropologie à l'exposition de 1889. Sciences biol. à la fin du xix^e siècle, Par., 1892, 100-106. — **Townsend** (C. W.) A case of sporadic congenital

cretinism. Arch. Pediat., N. Y., 1892, ix, 825-829. — **Tschisch** (V. F.) Vtor obzor sochin. po kriminalnoi antropologii. [Second cursory view of . . .] Arch. psychiat., etc., Charkov, 1892, xx, 104-112. — **Vance** (L. J.) The evolution of dancing. Pop. Sc. Month., N. York, 1892, xli, 739-756. — **Wilhelm** (E.) Matériaux pour servir à l'étude anthropologique du pavillon de l'oreille. Rev. biol. du nord de la France, Lille, 1891-2, iv, 201; 241; 329; 392. — **Zavitziano** (S. C.) Un cas de fausse gueue de déviation scoliastique et de difformité des membres inférieurs chez une petite fille. Gaz. méd. d. Orient, Constant, 1892-3, xxxv, 275-277. — **Zimmermann** (H.) Ueber den Stickstoff- und Phosphorsäuregehalt diluvialer Säugethierknochen. Mitth. d. anthrop. Gesellsch. in Wien, 1892, xxii [79-81].

NOTES AND NEWS.

ORIGIN OF CERTAIN MOUND RELICS.—The Shawnees have heretofore by common consent been regarded as the wanderers, the nomads, of the Indians east of the Mississippi. Recently there have been suggestions that they were formerly builders of mounds; and now Professor Cyrus Thomas,* adding to the number of his notable contributions to American archeology and ethnology, has essayed to show that the Shawnees were habitual mound-builders until after the arrival of Europeans, and that one of the mounds of the great Etowah group was made by them.

Attention has been drawn by several writers to the fact that the form of sepulture called box-stone graves is found wherever Shawnees dwelled. They are found in central Tennessee, which was for a long time their fixed home; in the Cherokee country, where a band lived for a time; in northern Georgia, where there were some villages of them; in Pennsylvania, where they lived with the Delawares; in Ohio and southern Illinois; and no other Indians have been known to practice this mode of burial, except, to some extent,

* The Shawnees in Pre-Columbian Times. *Am. Anthropol.*, vol. IV, 109, 237.

tribes with whom or near whom the Shawnees lived—the Delawares and some of the Illinois tribes. The box-stone graves must be accepted as an ethnic characteristic of the Shawnees.

In Tennessee, where the nation long had their home, cemeteries of box-stone graves are habitually associated with mounds; such graves are frequently found in mounds, and mounds are sometimes little more than a cover over tiers of graves. In Illinois the same contiguity and intermingling are found. It is certain that the mounds which contained such stone graves were built by the men who made the graves. That being admitted, there is little room left to doubt that the associated mounds and connected works were built by the same people. Hence it follows that the Shawnees, when a sedentary people, habitually made mounds and associated earthworks.

One of the Etowah group, a considerable mound, but dwarfed by the grandeur of the great one of the group, when carefully excavated was found to have been built over a group of stone graves. In some of these graves were found copper plates, incised, or stamped or hammered with outlined figures. These when found baffled conjecture. The care with which the excavation was made by practiced hands left no room for suspicion of fraud. They were, then, placed there by those who made the graves.

At first sight the figures stamped upon the copper plates seemed Mexican or Central American; but closer examination showed that while the figures in general were of the Mexican type, there were some differences. Some of the figures are winged; the wings are represented as part of an entire bird skin enveloping the figure as in the Indian designs, but are made to spring from the body behind and between the shoulders, which is a European conception. The drawing of the limbs is European, not Indian. On one plate are distinct marks of a sharp metallic tool. Another is made of pieces welded together. Several are fastened by small rivets, neatly wrought. The workmanship was European; the plates were made by Europeans to represent Indian designs. The question remained, How did they get to the northern part of Georgia when none are found south of that point?

In the seventeenth century Spaniards had settlements and worked gold mines in northern Georgia and contiguous territory. Portions of their work remain and contemporary records exist. Father Lalemont, in the Jesuit Relation for 1662, giving an account of the

Outoagaunha or Shawnees, brought by the Iroquois from an incursion into their country, says: "Their villages lie along a fine river that empties into a great lake, as they call the sea, where they have commerce with Europeans who worship God as we do, use rosaries, and have bells to summon to prayers. From their account we suppose these Europeans are Spaniards." According to De la Potherie, a Shawnee prisoner taken in 1665 gave a somewhat similar account.

The Shawnee builders of these graves might have got these plates from their Spanish neighbors. There are other circumstances which corroborate this view.

M. F. FORCE.

THE WHISTLE LANGUAGE OF THE CANARY ISLANDERS.—M. Joseph Lajard has printed in the *Bulletins of the Society of Anthropology of Paris* (Tome Deuxième, IVe Série, 3e et 4e Fascicules, 1891) two very interesting accounts of the whistle language of the Canary islands and of the use of whistling as a means of communication elsewhere. The knowledge of scholars regarding this means of converse was hitherto meager. The whistle language of the Canaries appeared to constitute a special phonetic system without any analogy with forms now known; but a sojourn of M. Lajard in the Canarian archipelago gave him the opportunity to determine the nature of this language. Its use is confined to the poorer classes and to shepherds, for even many of the islanders are ignorant of its existence. The methods of producing the whistled sounds are divided into three classes, according to the organs employed in their production, namely: *a*, by means of certain fingers of one hand applied to the mouth in one of five different attitudes; *b*, by means of certain fingers of both hands applied to the mouth in one of two different attitudes; *c*, by the means of the lips and tongue only.

The first thing decided was whether there was a musical basis for this system; but it was found that the same word is produced by notes executed differently according to the whim of the whistler. Some began with a grave or deep sound, ascending and afterward descending; others would choose a point of departure much higher and then descending back to the starting point. Every one uses a different register; there is analogy, but not identity. This observation clearly excludes the musical hypothesis. The whistled

sounds correspond exactly to the syllables of the spoken word ; but there is one more whistle syllable in names than there are in the spoken name ; it is an exclamatory hailing syllable ; hence, the pretended whistle language is of the Canaries nothing more or less than whistled Spanish, constituting no distinct system of speech.

The use of whistling is adapted to mountainous surroundings and not to level tracts.

It being possible to whistle other languages, it would be astonishing should it be found that they are not ; but a small number of observations shows that they are, but only in a very rudimentary manner. A sojourn in Corsica was the means of enabling M. Lajard to show that the shepherds there whistle with great ability, there being an analogy between their whistling and that of the Canary islands. It is very singular, he adds, to find it in cultured communities, even in Paris itself.

Workers at the same trade or occupation have this means of intercourse. Carpenters and stone-masons respectively have their language of whistled sounds. Beside that of the honorable professions, there is another, endowed with a rich vocabulary, found among thieves. Whistle language is highly appreciated among the poaching, marauding, and ex-convict gentry.

Evil-doers have borrowed names, and these are the ones whistled. This kind of sobriquets composes the bulk of the whistle language in Paris, which is very different from what is true in the Canary islands, where the entire language may be whistled. In cultured communities conventional signs compose the bulk of the whistle language.

"It appears," says M. Lajard, in closing, "from the sum of the facts that whistle language has a very wide distribution ; it will without doubt be found in many different places. At the present time, it is enough that we have discovered certain rudiments of it at Paris and elsewhere. Despite the enormous distance which separates the complete system of the Canaries from the simple traces of it seen in our streets, it appears to me useful to notice the features by which one may compare them, even should the comparison result only in the complete eradication of the ancient errors regarding that of the Canary islands. The special medium where it may flourish has been noticed, as well as certain analogies relative to those who employ it, in the condition and needs of their lives."

J. N. B. HEWITT.

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THE POET—IS HE BORN, NOT MADE?*

BY ROBERT FLETCHER, M. D.

Thomas Fuller, in his terse English, said: "He must be well mounted who is for leaping the hedges of custom." There is perhaps no custom more deeply rooted in general confidence than the belief in apothegms. You make some statement which seems a little bold—which questions some received tenet—"Oh," says one, "but you know what the proverb says!" and, quoting it, seems to think the matter settled as certainly as if the reply came from the Delphian oracle of old. We should not now give any heed to the hysterical utterances of the priestess of Delphos. Let us inquire a little into the truth of a saying which has been placidly quoted through many ages, and to which our assent is so frequently demanded.

The saying in question, *Poeta nascitur, non fit*, the poet is born, not made, is attributed to one Florus—not the historian—but a writer of whom little is known, except that a few epigrams and fragments ascribed to him have been preserved. One of these epigrams, also relating to the poet, is this:

"Consules fiunt quotannis, et proconsules;
Solus poeta non quotannis nascitur."

Ben Jonson has introduced this in his play of "Every Man in his Humour," where Justice Clement, speaking of the poet, says:

"They are not born every year, as an alderman. There goes more to the making of a good poet than a sheriff."

* Read before the Anthropological Society of Washington, December 6, 1892.

There is another version of this epigram which has been rather cleverly paraphrased by Taylor, the water poet:

“When Heaven intends to do some mighty thing,
He makes a poet—or at least a king.”

At the outset it must be understood that it is the second part of this adage that I assert to be untrue. No doubt the poet must be born a poet; the divine œstrum must be his as a birthright. You cannot by any known process of training or teaching make a poet of a man without this birthright; but it is equally true that the higher the teaching bestowed upon him, the broader the field of operation opened to him, the greater becomes the poet in proportion; and not only that, but it may be asserted that without such training, be it greater or less, the divine gift mostly comes to nought. What that training is, or should be, shall be presently considered.

Sir Philip Sydney, in his *Apologie for Poetry*, quotes the proverb in another shape: “A poet no industry can make if his own genius be not carried into it, and, therefore, it is an old proverb, ‘*Orator fit; poeta nascitur.*’” But he does not fail to protest against the implied meaning that genius is all that is needed to make the poet, for he continues: “Yet confess I always that as the fertilest ground must be manured, so must the highest flying wit have a Dædalus to guide him. That Dædalus, they say, both in this and in other, hath three wings to bear itself up into the air of due commendation; that is, art, imitation, and exercise.”

The “spontaneous theory,” as it may be termed, is not only of great antiquity, but it is continually reasserted in our own day. In a recent article in one of the English reviews, it was stated that Coleridge had stamped this doctrine with his high authority, and the following passage was quoted in proof:

“‘The man that hath not music in his soul’ can indeed never be a genuine poet. Imagery . . . , affecting incidents, just thoughts, interesting personal or domestic feelings, and with these the art of their combination or intertexture in the form of a poem, may all by incessant effort be acquired as a trade by a man of talents and much reading, who has mistaken an intense desire of poetic reputation for a natural poetic genius, the love of the arbitrary end for a possession of the peculiar means; but the sense of musical delight, with the power of producing it, is a gift of imagination; and this, together with the power of reducing magnitude into unity of effect, and modifying a series of thoughts by

some one predominant thought or feeling, may be cultivated and improved, but can never be learnt. It is thus that '*Poeta nascitur, non fit.*'" *

But surely the critic did not see that all that could be inferred from Coleridge's words was that the divine gift of poetic imagination came by birthright and not by acquisition. In another lecture, Coleridge, with indignation, rejects the often-repeated statement that Shakespeare wrote from inspiration only:

"What, then, shall we say? Even this, that Shakspeare, no mere child of nature; no automaton of genius; no passive vehicle of inspiration possessed by the spirit, not possessing it; first studied patiently, meditated deeply, understood minutely, till knowledge, become habitual, and intuitive, wedded itself to his habitual feelings, and at length gave birth to that stupendous power by which he stands alone, with no equal or second in his own class; to that power which seated him on one of the two glory-smitten summits of the poetic mountain, with Milton as his compeer, not rival." †

Similar views are expressed by Schlegel:

"To me he appears a profound artist, and not a blind and wildly luxuriant genius. I consider, generally speaking, all that has been said on the subject a mere fable, a blind and extravagant error. In other arts the assertion refutes itself, for in them acquired knowledge is an indispensable condition of clever execution; but even in such poets as are usually given out as careless pupils of nature, devoid of art or school discipline, I have always found, on a nearer consideration of the works of real excellence they may have produced, even a high cultivation of the mental powers, practice in art, and views both worthy in themselves and maturely considered."

I must dissent from the judgment which makes Milton the compeer of Shakespeare. His wonderful epic poems are full of majestic verse, and the sweetness, and even tenderness, of his sonnets and shorter pieces is unexcelled, but in power of imagination and of displaying the workings of human passion, neither Milton nor any other poet of any age or nation can, it is thought, be regarded as the equal of Shakespeare.

Before the question can be properly debated, it is essential to have some clear understanding of what qualities go to the making of a true poet. Let us see what some of them have said as to this.

* Coleridge's works: Lectures on Shakespeare, Lond., 1890, pp. 492-495.

† *Ibid.*, p. 500.

One of the most essential of these qualities is imagination, or, as Ben Jonson terms it, in a spirited eulogium on poetry, "sacred invention." The passage is well worth your hearing, the more so as it does not appear in the ordinary editions of his works, which are copied from the folio, but is to be found in the quarto edition of the play which first gave him fame, "Every Man in his Humor: "

"Indeed, if you will look on poesy
As she appears in many, poor and lame,
Patched up in remnants and old worn-out rags,
Half-starved for want of her peculiar food,
Sacred invention, then I must confirm
Both your conceit and censure of her merit;
But view her in her glorious ornaments,
Attired in the majesty of art,
Set high in spirit with the precious taste
Of sweet philosophy, and, which is most,
Crowned with the rich traditions of a soul
That hates to have her dignity profaned
With any relish of an earthly thought."

Bacon, elaborating a similar thought in Aristotle, said:

"The use of this feigned history (as he calls poetry) hath been to give some shadow of satisfaction to the mind of man in those points wherein the nature of things doth deny it, the world being in proportion inferior to the soul; by reason whereof there is, agreeably to the spirit of man, a more ample greatness, a more exact goodness, and a more absolute variety than can be found in the nature of things. Therefore, because the acts or events of true history have not that magnitude which satisfieth the mind of man, poesy feigneth acts and events greater and more heroical. Because true history propoundeth the successes and issues of actions, not so agreeable to the merits of virtue and vice, therefore poesy feigns them more just in retribution and more according to revealed providence. . . . And therefore poesy was ever thought to have some participation of divineness, because it doth raise and erect the mind by submitting the show of things to the desires of the mind, whereas reason doth buckle and bow low the mind into the nature of things."

The quality first enumerated by Sydney, namely, art, includes imagination and idealism. Every poet of the first rank has idealized not only his characters, but all the phenomena of nature. An ideal perfection which their own minds had conceived enabled the Greek sculptors to excel nature. To the reproach of a fanatic writer that this was an impious thought, Sir Philip Sydney replied that it redounded to the honor of the Heavenly Maker that he should

create man with such power of creating. "Nature," he continues, "never set forth the earth in so rich tapestry as divers poets have done; neither with pleasant rivers, fruitful trees, sweet-smelling flowers, nor whatsoever also may make the too-much-loved earth more lovely. Her world is brazen, the poets only deliver a golden."

Proclus saw clearly the fallacy of the imitative theory of art:

"He who takes for his model the forms which nature produces, and keeps to a literal imitation of these, can never reach what is perfectly beautiful. Nature is full of disproportion, and falls short of the true standard of beauty."

Another quality of the poet named by Sydney is imitation—not plagiarism; but let us hear Ben Jonson's definition of it:

"The third requisition in our poet, or maker, is imitation, to be able to convert the substance or riches of another poet to his own use. . . . Not as a creature that swallows what it takes in crude, raw, or indigested, but that feeds with an appetite, and hath a stomach to concoct, divide, and turn all into nourishment. Not to imitate servilely . . . but to draw forth out of the best and choicest flowers, with the bee, and turn all into honey, work it into one relish and savor."

Emerson, more boldly still, asserts the right to use other men's thoughts:

"Thought is the property of him who can entertain it, and of him who can adequately place it. A certain awkwardness marks the use of borrowed thoughts, but as soon as we have learned what to do with them, they become our own." Elsewhere he says that the greatest genius is the most indebted man.

There must be a limit to this use of other men's thoughts. It has been wittily said that while we may imitate a man's garb, we must not borrow his clothes. We need not, perhaps, inquire where the idea came from, but what use is made of it, or we may be led at last to accuse a writer of plagiarizing from the dictionary.

Wordsworth's fine line:

"Wisdom married to immortal verse,"

embodies the loftiest conception of the poet's work. But is this wisdom spontaneous or acquired? Surely the latter. It is the result of learning, observation, and thought, and to these will neces-

sarily be joined the love of the true and the beautiful, or, in the words of the most impassioned of women poets:

“What is true and just and honest,
What is lovely, what is pure,
All of praise that hath admonisht,
All of virtue, shall endure;
These are themes for poets’ uses,
Stirring nobler than the Muses.
O, brave poets, keep back nothing,
Nor mix falsehood with the whole;
Look up Godward; speak the truth in
Worthy song from earnest soul;
Hold, in high poetic duty,
Truest truth the fairest beauty!”*

Let us listen to Wordsworth’s definition of poetry:

“The poet is chiefly distinguished from other men by a greater promptness to think and feel without immediate external excitement, and a greater power in expressing such thoughts and feelings as are produced in him in that manner. But these passions and thoughts and feelings are the general passions and thoughts and feelings of men. And with what are they connected? Undoubtedly with our moral sentiments and animal sensations, and with the causes which excite these; with the operations of the elements and the appearances of the visible universe; with storm and sunshine, with the revolutions of the seasons, with cold and heat, with loss of friends and kindred, with injuries and resentments, gratitude and hope, with fear and sorrow. These, and the like, are the sensations and objects which the poet describes, as they are the creations of other men, and the objects which interest them. The poet thinks and feels in the spirit of human passions, for all good poetry is the spontaneous overflow of powerful feelings; and though this be true, poems to which any value can be attached were never produced on any variety of subjects but by a man who, being possessed of more than usual organic sensibility, had also thought long and deeply.”

Hear now what our own great thinker, Emerson, has to say:

“Poetry is the perpetual endeavor to express the spirit of the thing, to pass the brute body, and search the life and reason which causes it to exist; to see that the object is always flowing away, whilst the spirit or necessity which causes it subsists. Its essential mark is that it betrays in every word instant activity of mind, shown in new uses of every fact and image, and proportionately quickens the perception to relations. All its

* E. B. Browning: *The dead Pan*.

words are poems. It is a presence of mind that gives a miraculous command of all means of uttering a thought or feeling at the moment. The poet squanders on the hour an amount of life that would more than furnish the seventy years of the man that stands next him."

If it be true that poetry is the most philosophic of writings, dealing, as it does, with the general and not the particular, the highest poetry alone can merit the description. Shakespeare was not a scholar in the conventional sense, yet, not to speak of his genius, how full are his writings of knowledge, acquired by much reading, by wonderful insight into the minds of men and the springs of action, and by philosophy, the fruit of deep thought. His acquired knowledge, independent of his art, is so extensive that ingenious essays have been written to show that he must have been trained to the law, to medicine, to divinity; and separate books have been written upon his knowledge of birds, of animals, of flowers, and of folklore; and one surprising critic has gone beyond all, and declared that Shakespeare was a great statesman, a lord chancellor in fact, who was fined and imprisoned for accepting bribes.

And how thoroughly he possessed another of the lofty qualities of the true poet, impersonality. He creates his Portia, the model of virtuous loveliness, and his Cleopatra, the type of sensuousness, but he points out neither the merits of the one nor the vices of the other. He himself is never introduced; he has no didactic teachings, but the foreshadowed result is worked out. A critic commenting on this absolute impersonality of Shakespeare, and referring to the last scene of Anthony and Cleopatra, ends with this striking passage:

"He leaves the catastrophe to show us the inevitable end; the splendor of the feast is dimmed by no word of warning, the dancers whirl gaily by, the air is filled with the strains of music and the perfume of roses, but we see a handwriting on the wall, mysterious words in letters of flame, whereof the meaning is, 'God hath numbered thy kingdom and finished it; thou art weighed in the balances and art found wanting; thy kingdom is divided and given unto thine enemies!'"*

The opinion expressed of Shakespeare's wonderful genius by his friend and fellow-writer, Ben Jonson, in his introductory verses in the first folio edition of the former's works, is well known and has

* Dowden.

often been quoted, but one part of it is especially applicable to the present question :

“Yet must I not give nature all ; thy art,
My gentle Shakespeare, must enjoy a part ;
For though the poet's matter nature be,
His art doth give the fashion ; and that he
Who casts to write a living line, must sweat,—
Such as thine are,—and strike the second heat
Upon the Muse's anvil ; turn the same,
And himself with it, that he thinks to frame ;
Or, for the laurel, he may gain a scorn,—
For a good poet 's *made* as well as *born*.”

But the very loftiness of Shakespeare's fame has unwittingly led to injustice to his contemporaries and successors. “Brave men lived before Agamemnon,” and the great writers who preceded, were coeval with, and followed Shakespeare, who filled

“The spacious times of great Elizabeth
With sounds that echo still,”

have been comparatively neglected in the almost idolatrous worship of the man who was supreme over all. The young student of literature should be warned not to study the great poets too exclusively, lest it tend to incapacitate the judgment. There is a rich harvest-field in the works of the minor poets, if the reaper be diligent and capable of selecting.

Another quality of the poet is his universality. The men of action, the politicians, take but one view, see but one side of a thing, and they are fearfully in earnest in their beliefs, but the man of philosophic mind weighs both or all sides of a question and gives each its due. Compare Scott with Warren. How true to nature are all the men and women in the novels of the first, and how the coarse prejudices of the politician disfigure the otherwise powerful works of the latter. He was such a bitter tory that in his ablest novel, *Ten Thousand a Year*, not only are all the radicals villains or vulgar knaves, but they have all, without exception, low and degrading names.

The poet must be, in a large sense, a man of science. He must learn at least to accurately observe. He may not analyze the blossom nor dissect the bird, but he must know what flowers bloom and what songs of birds are to be heard as the seasons change. He

must note physical phenomena and describe their sequence with the precision of a trained observer. Could the most skilled of scientific observers describe the coming on of a tempest as seen from a mountain peak more truly than the poet has done?

"As one that climbs a peak to gaze
O'er land and main, and sees a great black cloud
Drag inward from the deeps, a wall of night
Blot out the slope of sea from verge to shore,
And suck the blinding splendor from the sand,
And quenching lake by lake, and tarn by tarn,
Expunge the world." *

Sir Philip Sydney insisted strongly that verse is not a necessary part of poetry :

"Sith there have been many most excellent poets that never versified, and now swarm many versifiers that need never answer to the name of poets. . . . It is not rhyming and versing that maketh a poet, no more than a long gown maketh an advocate ; who though he pleaded in armor should be an advocate and no soldier."

He instances Xenophon's Retreat of the Ten Thousand and Nathan's parable, as poetry without rhyme or meter.

"When David," he continues, "had so grievously sinned, and Nathan, the prophet, was sent to do the office of a friend in laying his shame before his eyes, how did he it? By telling of a man whose beloved lamb was ungratefully taken from his bosom ; the application most divinely true, but the discourse itself feigned."

Emerson insists that cheerfulness is an essential part of a poet's composition :

"One more royal trait properly belongs to the poet. I mean his cheerfulness, without which no man can be a poet, for beauty is his aim. He loves virtue, not for its obligation, but for its grace ; he delights in the world, in men, in women, for the lovely light that sparkles from them. Beauty, the spirit of joy and hilarity, he sheds over the universe."

Wordsworth, too, ends a spirited passage describing the subjects of which the poet must write with this characteristic and strong line :

"Of joy in widest commonalty spread."

The poet must discover what form of meter will best enable him

* Tennyson.

to clothe his thoughts. He will probably make many experiments before he satisfies himself, and may retain, as many poets have done, the art of using several forms of meter. In Tennyson's first volume of poems, that is, the first exclusively his own, there are over twenty different forms of meter. He will not content himself with merely trying established meters, but may also invent original forms of his own.

A by no means unimportant part of the poet's work is the "polishing his lines." He must expunge mean, trivial words, and get rid of alliteration.

"Gently make haste, of labor not afraid;
A hundred times consider what you 've said;
Polish, repolish, every color lay,
And sometimes add, but oftener take away." *

Lowell, in a posthumous essay, says:

"It may be asked if these minutiae are consistent with anything like that ecstasy of mind from which the highest poetry is supposed to spring, and which it is its function to reproduce in the mind of the reader. But whoever would write well must *learn* to write. Shelley was almost as great a corrector of his own verses as Pope. Even in Shakespeare we can trace the steps and even the models by which he arrived at that fatality of phrase which seems like immediate inspiration. One, at least, of the objects of writing is, or was, to be read, and, other things being equal, the best writers are those who make themselves most easily readable."

Poets sometimes resort to artifices. Boileau communicated to Racine that notable receipt of making the second line of a couplet before the first.

But, above all, the poet must study the great central figure of this world—man. Descriptive poetry which delineates natural scenery soon becomes wearisome, but one never tires of the exhibition, if by a master hand, of the workings of the human mind.

"Othello," says a great writer, "is perhaps the greatest work in the world. From what does it derive its power? From the clouds? From the ocean? From the mountains? Or from love strong as death, and jealousy cruel as the grave?"

Having thus cited the views of some masters of the art, is it not obvious that they are alike in demanding for the poet that he shall

* Dryden : Art of Poetry.

receive fit training? That he is to be made a poet as well as to be born one? Much has been written about the spontaneous in poetry; that the poet should burst into song as naturally as the flowers bloom and the birds sing. As in most arguments by analogy, there is a fallacy in the premise, for the wild flower bears no comparison with the cultivated variety. The dog-rose grows spontaneously everywhere, but the roses which make our senses ache with their gorgeous colors and voluptuous odors are the product of cultivation. There is spontaneity in the songs of the birds, but every bird-lover can tell you that training and imitation of older singers are essential to make a good song-bird. Perhaps if we divested the song of its accompaniments, the beautiful plumage of the bird, its arch, dainty ways, the romantic woodland or the forest tree, we should judge better of the real beauty of the song. There is a legend of a contest between a bird and a lute, wherein the superiority of the human-made instrument is touchingly related. It is in a play by John Ford, one of Shakespeare's contemporaries. Two friends, Menaphon and Amethus, meet, the former accompanied by a beautiful youth:

“MENAPHON. Passing from Italy to Greece, the tales
Which poets of an elder time have feigned
To glorify their Tempe, bred in me
Desire of visiting that paradise.
To Thessaly I came; and living private,
Without acquaintance of more sweet companions
Than the old inmates to my love, my thoughts,
I day by day frequented silent groves
And solitary walks. One morning early
This accident encountered me: I heard
The sweetest and most ravishing contention
That art and nature ever were at strife in.

AMETHUS. I cannot yet conceive what you infer
By art and nature.

MEN. I shall soon resolve ye.
A sound of music touched mine ears, or rather
Indeed entranced my soul. As I stole nearer,
Invited by the melody, I saw
This youth, this fair-faced youth, upon his lute,
With strains of strange variety and harmony,
Proclaiming, as it seemed, so bold a challenge
To the clear quisters of the woods, the birds,
That, as they flocked about him, all stood silent,
Wondering at what they heard. I wondered too.

AMET. And so do I; good, en!

MEN. A nightingale,
Nature's best skilled musician, undertakes
The challenge, and for every several strain
The well-shaped youth could touch, she sung her own;
He could not run division with more art
Upon his quaking instrument than she,
The nightingale, did with her various notes
Reply to; for a voice and for a sound,
Amethus, 'tis much easier to believe
That such they were than hope to hear again.

AMET. How did the rivals part?

MEN. You term them rightly,
For they were rivals, and their mistress, harmony.
Some time thus spent, the young man grew at last
Into a pretty anger, that a bird,
Whom art had never taught cliffs, moods, or notes,
Should vie with him for mastery, whose study
Had busied many hours to perfect practice;
To end the controversy, in a rapture
Upon his instrument he plays so swiftly,
So many voluntaries and so quick,
That there was curiosity and cunning,
Concord in discord, lines of differing method
Meeting in one full center of delight.

AMET. Now for the bird.

MEN. The bird, ordained to be
Music's first martyr, strove to imitate
These several sounds; which when her warbling throat
Failed in, for grief down dropped she on his lute,
And brake her heart."

But, leaving the analogy, does not the history of all poets tell us how they first "lisped in numbers?" Do we ever read the "juvenile poems" which form part of the collected works of the master, except from curiosity? Regard the progress of the greatest English poet of the century. Tennyson never saw fit to republish his volume of early poems, and no publisher has, I believe, ventured to print them in despite of his understood wishes. The volume in question, "Poems by Two Brothers," as it was modestly called, appeared in 1827. The publisher gave ten pounds for this collection of poems, a price which was thought to be, and was, a liberal one. At the present time that price is gladly paid for a single copy of the volume, so scarce has it become.

The first volume of poems exclusively his own was published in 1833, and the revision which his better-educated taste had taught him was well seen in the next volume, which appeared in 1842. Upon the appearance of the former volume, a merciless criticism appeared in the *Quarterly Review*, understood to have been written by the editor, Lockhart. It was, from some points of view, unfair, but it showed with relentless vigor all the weak points of the poet's work. After a silence of ten years, a new volume was brought out, which instantly placed Tennyson in the very foremost rank of English poets. It is a curious fact that the pieces which Lockhart had so severely criticised in the volume of 1833 were either entirely omitted in the next collection or were most carefully purged of their defects. A recent critic, Mr. Van Dyke, has given an illustration of the latter in the contrast between an original passage in the "Miller's Daughter" and the revised form in which it appeared in the volume of 1842.

A lover, gazing idly at the widening circles produced by something plunging in a pool, suddenly sees in them a beloved face and form :

"Remember you that pleasant day
When, after roving in the woods
(’Twas April then), I came and lay
Beneath the gummy chestnut-buds
That glistened in the April blue?
Upon the slope so smooth and cool
I lay and never thought of *you*,
But angled in the deep mill-pool.

A water-rat from off the bank
Plunged in the stream. With idle care
Downlooking through the sedges rank
I saw your troubled image there.
Upon the dark and dimpled beck
It wandered like a floating light,
A full fair form, a warm white neck,
And two white arms—how rosy white!"

These verses were true to nature—quite spontaneous in their freedom—but the inexorable critic had pointed out the curious mixture of metaphor and description—the gummy chestnut-buds, and the water-rat, and the rest, and, not too self-contained, but bent upon

mastery, the born poet, who was being made, printed the lines in this form in his next volume :

“O, Alice, what an hour was that,
When, after roving in the woods
(’Twas April then), I came and sat
Below the chestnuts, when their buds
Were glistening in the breezy blue ;
How on the slope, an absent fool,
I cast me down, nor thought of you,
But angled in the icy pool.

Then leapt a trout. In lazy mood
I watch’d the little circlets die ;
They passed into the level flood,
And there a vision caught my eye ;
The reflex of a beauteous form,
A glowing arm, a gleaming neck,
As when a sunbeam wavers warm
Within the dark and dimpled beck.”

Ruskin, commenting on some lines of Tennyson in the *Lady of Shalott*—

“In the stormy east wind straining,
The pale yellow woods are waning,
The broad stream in his banks complaining,
Heavily the low sky raining,
Over tower’d Camelot,”

says that this is a “a pathetic fallacy,” for clouds do not weep nor rivers complain. Could matter-of-fact realism further go? It does not need the divine spirit of the poet, the capacity to express great thoughts, to enable one to hear whispers in the trees, melody or complainings in the flowing water, and the voices of the gods in the thunder. Who does not feel that heaven wept for doomed man in that fine passage in *Christ’s Victory*, when the just anger of God is about to be launched against the world, given over to wickedness?

“And the Almighty’s self, as he would tear
The Earth and her firm basis quite in sunder,
Flamed all in just revenge and mighty thunder ;
Heaven stole itself from Earth by clouds that moistened under.”

It is a common error in criticism to speak of the arts of poetry, music, and painting as if they were all parts of one system of imagi-

native thought, with the addition of varying technique, as of color in painting, sound in music, and rhythm in poetry; but it must be remembered—

“That the sensuous material of each art brings with it a special phase or quality of beauty, untranslatable into the form of any other—an order of expression distinct in kind.” *

The distinction of these sister arts does not affect the question of cultivation in each.

“We want design,” says Emerson, “and do not forgive the bards if they have only the art of enameling. We want an architect, and they bring us an upholsterer.”

It is a melancholy piece of work to look through such a collection as, say, Chalmers’s British Poets, and then to ask yourself how many of these men pronounced to be poets have been really among the immortals? Take out perhaps a dozen or twenty names, and you can safely wager that the rest will never have been heard of by ordinarily well-read persons. In the time of James I, one of the most popular of poets was Joshua Sylvester, and he was chiefly famous for his translation of the *Divine Weekes of Du Bartas*. Who ever quotes a line from the latter! And yet it has been said that no poet, except Voltaire, ever enjoyed such celebrity. And our own age is perniciously fertile in men and women with a “knack of rhyming.” If a great man dies, or a child is born, or a sunset is unusually red, out comes the ready sonnet or lyrical effusion, to which you listen decorously, but are tempted to repeat Christopher Sly’s words:

“’Tis a very excellent piece of work: would ’twere done!”

Macaulay tells us that Warren Hastings, when he had retired to a country life after his stormy public career had closed, was accustomed to read every morning at the breakfast table a sonnet or poem which he had written since rising. Such cruelty would seem to justify the charges made by Sheridan in his brilliant Begum speech.

“The art of versifying,” says Southey, “is a distinct talent, and a metrical ear has no more necessary connection with the intellect than a musical ear.”

* Pater: *Renaissance*, p. 135.

The versifiers are indeed the spontaneous poets; they carol away like the birds on the trees, without invitation or encouragement, and even in spite of warnings to desist. Carlyle said that in the golden age to come publishers and the public will pay authors for what they do not write.

Another characteristic of the poet is the honest love for, and belief in, the reality of his creations. They are living men and women to him, for they embody his wisdom and experience. They are better or worse than the average human being, but only to the extent of emphasizing the type. The poet is too true to his art to make moral monsters of his heroes. They are human, they sin, they repent, but how carefully the motives of their actions are developed. They are so real to him that he asks your charity for their shortcomings. Marmion had destroyed his rival by means of a forged letter, but after his own death on Flodden field, how artfully the poet makes the reader a supposed offender like the hero in order to bring in the tender verdict at the end:

"If ever, in temptation strong,
Thou left'st the right path for the wrong;
If every devious step thus trod
Still led thee further from the road,
Dread thou to speak presumptuous doom
On noble Marmion's lowly tomb;
But say, 'He died a gallant knight,
With sword in hand, for England's right.'"

Shakespeare brought his master creation, Othello, to a tragic death through his vehement passions and childlike credulity; but see how he cares for him at the supreme moment—how touching his defense of him in Othello's last words:

"Then must you speak
Of one that loved not wisely, but too well;
One not easily jealous, but, being wrought,
Perplexed in the extreme."

What a surprising fullness of meaning there is in that word "wrought." How it brings before us the whole panorama of subtle devices to which he has fallen a victim.

If his creatures seem real to the poet, how natural it is that he should inspire the same conviction of reality in the minds of his readers, and to achieve this he must have the power to detach his characters from his own thoughts; they must become objective.

How real are the heroes of the Iliad ! Achilles eating his heart out in indignation in his tent ; Hector forcing his way to the Grecian ships through a lane of carnage—how plainly we see him entering the archway with a spear in each hand, shaking the nodding terrors of his plume :

“He moves a god, resistless in his course.”

The very gods and goddesses, equally the creation of the poet, how real they are :

“The old gods, that bright and jocund train,”

as Goethe termed them, how natural it was that they should take sides in the ten years' fighting around Troy, and even enjoy an occasional share in it. When Athene puts on her immortal armor and, taking her mighty father's spear and shield, drives the “strong god of war” wounded and howling from the field, we care nothing for the allegory. It is needless to tell us that Athene personifies wisdom, and Ares brute force. We know that the fight took place, and are glad that the insolent bully received the merited punishment.

This wonderful power of inspiring a sense of reality is equally shared by the romancer, who is, at his best, a prose poet. Coleridge said that the best poet must write the best prose ; and it is not only the great masters of fiction who possess this power. Even so formal a writer as Richardson could inspire this feeling. It is told that a village blacksmith who happened to obtain a copy of “Pamela, or Virtue Rewarded,” read it aloud every evening, while seated on the anvil in front of his shop, to the assembled villagers. Their patience was equal to the prolixity of the author, and they followed the heroine through her various adventures and perils with growing interest ; so that when the lovers were at last united, a shout of joy arose from the rustic audience, and procuring the keys of the church, they rang peal after peal upon the bells, just as they would have done if the lord of the manor had brought home his bride.

James Russell Lowell relates that he one day met Thackeray with such evident traces of grief and even suffering upon his face that Lowell looked at him with alarm and sympathy. Thackeray, in response to the mute inquiry, said in a tremulous voice : “I have just killed Colonel Newcomb.” One can understand the emotion of the great-hearted author after writing that unequaled and pathetic scene.

The reader of poetry, too, must perhaps be born with the critical faculty :

“Both must alike from heaven derive their light,
These born to judge, as well as those to write.”

But cultivation is as necessary for the one as for the other.

“An accurate taste in poetry,” says Sir Joshua Reynolds, “and in all the other arts, is an acquired talent, which can only be produced by thought and a long-continued intercourse with the best models of composition.”

Who of us has not looked back with wondering pity at some of the favorite poems of our early days? Emerson sums it up :

“What we once admired as poetry has since come to be a sound of tin pans; and many of our later books we have outgrown.”

There is another part of a poet's work to which, however, he is not necessarily called, which demands especial scholarship in addition to poetic art, namely, translating. It is not enough that he should thoroughly understand the language of his author—it is not enough to be a master of his own tongue—though both of these are pre-essential, but he must thoroughly comprehend the spirit and age of the original and be in some sort the poet he is to translate. How many generations of men who could not read a line of Homer have enjoyed Pope's translation? True, it is full of errors and faults of carelessness, but it is so melodious and the spirit of the age is so well sustained in it that we can say with Christopher North, “If it be not Homer we must be thankful for another Iliad.”

Upon the whole, it may be said, perhaps, that no poet has excelled Dryden as a translator. Nothing can be more perfect than his presentation of the spirit and feeling of the original in his version of the twenty-ninth ode of Horace, of which I will venture to quote one stanza :

“Happy the man, and happy he alone,
He who can call to-day his own;
He who, secure within, can say,
To-morrow do thy worst, for I have lived to-day.
Be fair or foul, or rain or shine,
The joys I have possessed in spite of fate are mine.
Not heaven itself upon the past has power;
But what has been, has been, and I have had my hour.”

There has been much debate as to when poetry took its origin. We know there were poets before Hesiod and Homer, and it has been asserted that pastoral poetry is as old as the human race. Strabo declares that poetry was the original language of men, and that prose is only an imitation. If this curious theory be correct, we should be obliged to look more pityingly upon the herd of versifiers, believing that their unhappy condition is in reality a case of atavism.

The early history of most nations was chiefly recorded in poetry; that of the Hindoos entirely so. The Mahabarata is an epic history, complete and compendious. The poet did not falsify history, but presented it by peculiar methods belonging to his art. When Shakespeare wrote his historical plays he gave to generations of readers a vivid picture of English history which they never would have learnt so thoroughly or impressively from ordinary writers. It cannot be questioned that poetry has the advantage over prose of condensation of thought and of attractiveness of sound, and from these qualities it is more readily stored up in the memory.

" Well-sounding verses is the charm we use
Heroick thoughts and virtue to infuse ;
Things of deep sense we may in prose unfold,
But they move more in lofty numbers told :
By the loud trumpet, which our courage aids,
We learn that sound as well as sense persuades." *

I have endeavored in this rapid and necessarily imperfect sketch of a very copious subject to describe the qualities which critics and poets concur in attributing to the true poet. I have endeavored to show that the greatest poets are those who have loved truth and wisdom above all things; who have striven valiantly after all attainable knowledge; have deeply studied the human mind and its passions; have observed nature with close scrutiny; have mastered to the extent of their opportunities the treasures of poetry and prose in their own and other tongues, and have diligently sought to perfect their art in melody and method. When to the divine birth-right some share, be it greater or less, of these qualities which are attainable only by labor is added, are we not justified in saying that the poet was born and was made? Or, in conclusion, it may be summed up in Aristotle's threefold division of poetry in relation to its progress: Nature without art; art begun; art completed.

* Waller.

A KACHGAR-CHINESE MENU.—The menu of a dinner given M. Blanc, the French explorer, by the Chinese governor of Kachgar (on the borders of Siberia) was as follows: "Shark fins; holothuries (jelly-fish?) stuffed with marrow; eggs stuffed with perfumed jelly; bamboo roots pickled in palm oil (to be eaten with fish-spawn at the end of the repast); duck à la mode, Yun-nam and forced meat-balls of duck livers; rat tails preserved in sugar; comfits of leeches (blood suckers); salamanders (a species of lizard), preserved and stuffed."

A menu such as this, absolutely authentic, presents a style of eccentricity to satiate the most ardent haters of the common and conventional.

Notwithstanding the fantasticalness of it and the strangeness of the dishes composing it, the dinner was not at all uneatable; the duck and the leeches were simply delicious, but the bamboo roots were more than detestable.—*Revue, Société de Géographie de Tours* (Dec., 1892).

J. N. B. HEWITT.

SLAVERY IN EASTERN AFRICA.—It is learned from Aden (*Revue, Société de Géographie de Tours*, Dec., 1892) that there is a recrudescence of slavery. Daily more numerous caravans arrive, bringing human cargoes. The slaves come chiefly from the Congo, Monboutou, Ounyorou, Tourkana, Ougogo, and even from Lobemba. The Arabs of the Soudan have combined for these razzias in a common effort, determined to it in consequence of the rates attained by slavery in Egyptian Soudan, Arabia, and in Persia—1,200 francs per head for men between 25 and 30 years of age, and 3,000 francs per head for girls between 14 and 20 years of age. Caravans pass to Witu without any difficulty, where the English have been able to obtain peace only by the maintenance of an excessive tolerance of the commerce in slaves, the sole cause of revolt. The Arab "boutres" load equally at Opia, Gardafui, Zeilah, Djibouti, Massoua, and Souakim. At the end of the month three caravans passed Tokar, and, according to the natives, the forced marches and the secret embarkments have caused a dead loss to the traders of 70 per cent. Accordingly they are furious and have accepted in exchange only improved guns, intended to fight against Europeans.

J. N. B. HEWITT.

SIMPLIFIED SPELLING.

A symposium on the question "Is simplified spelling feasible as proposed by the English and American Philological Societies?"*

OPENING ADDRESS.

BY F. A. MARCH, PROFESSOR IN LAFAYETTE COLLEGE,
Chairman of the Committee on English Spelling of the American Philological Association.

The movement for the reform of English spelling is a product of the spirit of the age—a true *birth of time*, as Bacon likes to call his philosophy. We are for reforming everything that can help us in the discovery of truth and the improvement of man's estate.

Given a spoken language, the easy communication of it by writing and printing is a problem in labor-saving machinery. It is doubtful whether the welfare of the race is as much promoted by any invention of the century, whether the steam engine or the telegraph contributes as much to the progress of the people as would the invention and introduction of a good system of spelling our language. The difference between a family who can read and one who cannot is vastly more important than the difference between a family that uses railroads and telegraphs and one that does not.

It is currently stated by students of language that English words as commonly spelled contain a large proportion of letters which are superfluous and misleading, and which greatly increase the cost of writing and printing. It is found that the removal of silent e's would save 4 per cent. of all the letters on a common printed page; that the removal of one consonant of each pair of duplicated consonants would save 1.6 per cent. In the New Testament, printed in phonetic types in 1849 by A. J. Ellis, one hundred letters and spaces are represented by eighty-three. As far as printing and paper are concerned, a six-dollar book would be thus reduced to five dol-

* The spelling used in each paper is that preferred by its author. The opening address is in the spelling recommended by the philological societies.

lars. The Encyclopædia Britannica would make twenty volumes insted of twenty-four, and cost twenty-four dollars less. One-sixth would be saved in all writing. Think of the manuscripts of books and periodicals, the boundless expanses of the daily papers, the records of courts, deeds, wils, and other legal documents, the sermons of preachers, the books of business men, and correspondence of all sorts. More than four billions of writn communications in English pass thru the mails in a year; and one-sixth of all this is superfluous and misleading. It is also currently stated by leading educators that the irregular spelling of the English language causes a loss of two years of the scool time of each child, and is a main cause of the alarming illiteracy of our peple; that it involvs an expense of many millions of dollars annually for teachers, and that it is an obstacl in many other ways to the progress of education among those speaking the English language, and to the spread of the language among other nations.

The Hon. J. H. Gladstone has carefully collected the statistics of English scools, and he finds that the average time allotted to spelling, reading, and dictation is 32.2 per cent. of the time devoted to secular instruction. An average English child spending eight years in scool spends 2,320 scool hours in these exercises. He concludes that 720 hours of spelling lessons might certainly be dispenst with if our spelling wer simplified. And, further, upon comparing the scools of England with those of Italy, Germany, and other cuntries, he is convinced that "if English orthograpy represented English pronunciation as closely as the Italian does, at least half the time and expense of teaching to read and spel would be saved. This may be taken as 1,200 hours of a lifetime, and as more than half a million of money [\$2,500,000] per annum for England and Wales alone. . . . In the elementary scools of Italy, tho the aggregate time of schooling is shorter, the children lern much about the laws of helth and domestic and social economy. In Germany they acquire considerabl knowledge of literature and science, and in Holland they take up foren languages. It is lamentabl how small a proportion of our scholars ever advance beyond the mere rudiments of larning—a circumstance the more to be regretted as they wil hav to compete with those foren workmen whose erly education was not weigthed with an absurd and antiquated orthograpy."

The hindrance which our spelling offers to the spread of our language and thought among other nations, the importance of amended

spelling to our nation in the struggle for supremacy in commerce and political influence among the cultured nations, is a most interesting topic, but I leave it to the illustrious author of "World-English." Complete simplification of our spelling would make our language the easiest to learn of all the great languages, help us in the race for commercial supremacy, and make English the world-speech. Leading educators, among whom are many teachers of much practical experience, and associations of learned scholars declare it possible to improve our spelling and have proposed plans of improvement. Since the growth of the modern science of language the most important propositions for improvement have come from the students of language.

A revision of the alphabet is necessary for perfect scientific spelling, and a revision was made in 1877 by the American Philological Association. In 1883 a scheme of partial amendments was jointly approved by the Philological Society of London and the American Philological Association and recommended for immediate use.

Whether this scheme is feasible is the theme of this symposium.

A few words first about the philological societies as authorities in spelling reform. Some authority is evidently needed, or unanimous action; but the reform of spelling seems so easy that every one thinks he can manage it. Every bright teacher or newspaper man whose attention is attracted to it has a scheme. "He hears of it Saturday, incubates Sunday, and prints his scheme on Monday;" and the number and complexity of the laws and analogies of English are such that something may be said—something good may be said—in favor of something in every scheme. When a convention is gathered, like the International Convention of 1876, and all the men with schemes get together, it becomes plain that the world will not last long enough for them to talk each other into an agreement. It was a bright idea of our Centennial Convention to refer the matters at issue to the American Philological Association. That association then consisted of 227 members (in 1891 it had 380) most of them professors of languages, including the most eminent professors in all our great universities and colleges. It was, and is, our most eminent body of experts in language.

The Philological Society, whose headquarters are in London, is also general headquarters for the experts in linguistic study in Great Britain, and especially, of late years, in the study of English. From them comes the Historical Dictionary of English, which is in prog-

ress of publication by the University of Oxford, the supreme achievement of our day in language studies. They counted among their members Alexander Graham Bell, the Darwin of fisiological alfabetics ; Alexander J. Ellis, whose huge volumes upon Erly English pronunciation ar the thesaurus of all investigators ; F. J. Furnivall, the founder and director of the Early English Text Society, the Chaucer, the New Shakespere, the Browning Society ; Dr. Murray, editor-in-chief of the great dictionary ; R. Morris, of King's College ; Kington-Oliphant ; J. Peile, master of Christ College, Cambridge ; A. H. Sayce, professor of filology at Oxford ; H. Sweet, the hed of all the students of Old English in Great Britain ; W. W. Skeat, professor of Anglo-Saxon at Cambridge ; Wedgewood, author of the Etymological Dictionary. These and their comrades ar known to every one as experts and authorities in language. It may be added that the spelling reform associations had and hav among their officers and members many statesmen, literators, and scientists ; Darwin and Tylor and Tennyson and Max Müller wer vice-presidents. W. E. Gladstone, Herbert Spencer, Senators Sumner, Stephens, and Marsh hav writn in favor of the reform.

The filological societies are good authority for improvements in spelling, the natural authority for English-speaking men, like the French Academy for Frenchmen, and like the other lerned academies which hav revised the spelling of other cuntries of Europe.

Next, their action—what has it been ?

In 1875, in response to many appeals, a Committee on Spelling Reform was appointed by the American Philological Association. It consisted of Profs. W. D. Whitney and J. Hammond Trumbull, of Yale ; Prof. F. J. Child, of Harvard University ; Prof. F. A. March, of Lafayette College, and Prof. S. S. Haldeman, of the University of Pennsylvania. They presented a report in 1876, which describes the ideal spelling at which reformers should aim. In 1877 a second report gave a Roman alfabet for English use. If our language wer spelt by this alfabet it would be easy for our children and the illiterate to lern. They coud read right off as soon as they lernd their letters. It would be easy also for all who read French, German, Latin, Greek, or Anglo-Saxon. It would make the lerning of foren tungs easy. It would fix the scool pronunciation of Latin and Greek. It would revive the speech of our old English authors. Shakespeare would be trubld to understand Hamlet as we now pronounce it ; Chaucer coud make nothing of our reading of

the Canterbury Tales. All this promises fairly. But the report of the committee goes on to say that "the use of these letters with only these powers and the dropping of all silent letters wil so change the look of large numbers of words that they wil not be recognized at sight." Perfect spelling of this sort cannot therefore be introduced immediately into the newspapers and other common literature of a generation who know no spelling but the old. The ideal alfabet may cum into immediate use in the scools to teach beginners to read, and as a key alfabet in scientific publications, in filological essays, in dictionaries to giv the pronunciation, in geografigal works, books of travel, tales in dialect, and the like. It is also necessary as a guide in making minor changes, for there must be a transition period, gradual progress, in the issues of the popular press.

This brings us to the action upon gradual amendments, and it wil be wel to quote the language of the first report :

"It does not seem desirabl to attempt such sweeping changes as to leav the general speech without a standard or to render it unintelligibl to common readers ; but the changes adopted in our standards of the writn speech hav lagd far behind those made in the spoken language, and the present seems to be a favorabl time for a rapid reform of many of the wurst discrepancies. The committee think that a considerabl list of words may be made in which the spelling may be changed, by dropping silent letters and otherwise, so as to make them better conform to the analogies of the language and draw them nearer to our sister languages and to a general alfabet and yet leav them recognizabl by common readers, and that the publication of such a list under the authority of this association would do much to accelerate the progress of our standards and the general reform of our spelling."

In 1878 the committee presented the following words as the beginning of the list, and recommended them for immediate use: *ar, catalog, definit, gard, giv, hav, infinit, liv, tho, thru, wisht.*

In 1880 the president of the Philological Society of England, Dr. Murray, in his retiring address introduced a discussion of practical amendments of spelling, which was continued thru six meetings. Mr. Sweet was authorized to prepare a statement of the results. This was finally adopted in January, 1881, and publisht as a pamphlet. The American Philological Association approved a part of the amendments the same year.

In 1882 the English Society past a resolution requesting H. Sweet, Esq., to communicate with the American Association in order to ascertain whether in was practicabl to effect a complete agreement,

so that "a joint scheme might be put forth under the authority of the two chief filological bodies of the English-speaking world." Mr. Sweet communicated with the American Philological Association and satisfactory correspondence resulted.

In 1883 the two associations effected a complete agreement and put forth a scheme of "Partial corrections jointly recommended for immediate use." The joint scheme was originally in the form of comments upon each letter, giving words, or classes of words, in which it was to be changed, with reasons for the changes, exceptions to the rules, and the like. Most of the corrections cum under the following ten rules:

RULES.

1. e.—Drop silent *e* when fonetically useless, writing *-er* for *-re*, as in *live*, *single*, *eaten*, *rained*, *theatre*, etc.
2. ea.—Drop *a* from *ea* having the sound of *ɛ*, as in *feather*, *leather*, etc.
3. o.—For *o* having the sound of *u* in *but* write *u* in *above* (abuv), *tongue* (tung), and the like.
4. ou.—Drop *o* from *ou* having the sound of *u* in *but* in *trouble*, *rough* (ruf), and the like; for *-our* unaccented write *-or*, as in *honour*.
5. u, ue.—Drop silent *u* after *g* before *a*, and in nativ English words, and drop final *ue*: *guard*, *guess*, *catalogue*, *league*, etc.
6. Dubl consonants may be simplified when fonetically useless: *bailiff* (not *hall*, etc.), *battle* (batl), *written* (writn), *traveller*, etc.
7. d.—Change *d* and *ed* final to *t* when so pronounced, as in *looked* (lookt), etc., unless the *e* affects the preceding sound, as in *chafed*, etc.
8. gh, ph.—Change *gh* and *ph* to *f* when so sounded: *enough* (enuf), *laughter* (lafter), etc.; *phonetic* (fonetic), etc.
9. s.—Change *s* to *z* when so sounded, especially in distinctiv words and in *-ise*: *abuse*, verb (abuze), *advertise* (advertize), etc.
10. t.—Drop *t* in *tch*: *catch*, *pitch*, etc.

The joint rules wer printed in the Proceedings of the American Association for 1883. It was known that the application of the rules is difficult and that an alfabetic list of amended words must be made to exhibit fully the action of the society. It 1886 such a list was reported from the American committee and printed in the transactions of the association. It was reprinted, with an introduction by Professor Whitney, in the Century Dictionary in 1891.

Its words ar introduced as vocabulary words in the forthcoming Standard Dictionary of the Funk and Wagnalls Company.

These ar cautious advances. The work of filologists upon literary language is carried on like the pruning and dressing of an orchard or garden, where all is dear to the gardener. The English literary language is a charming growth. One who has grown up in it and lerned it wel cannot help loving it. He may see, to be sure, that these wild trees hav many knots and gnarls, twists in the branches, and broken boughs ; that there ar weeds among the flowers. He may recognize that the beuty of proportion, order, simplicity, fitness for use, is higher than wild beuty. He may recognize the difference between spoken language and the writn characters, which ar machinery of communication ; but, after all, there is a glamor of association which makes the old spelling dear and venerabl, like the aroma of choice old bindings. It wil be found in these proposed changes that an attempt has been made not only to spare everything useful, but to respect old associations.

The first rule, that for dropping silent *e*, seems to be a very good one. This *e* is prevailingly an orthografic expedient to denote that the vowel before it is long : it lengthens *fat* into *fate*, *bit* into *bite*, *fin* into *fine*, and the like. Whenever it follows a short vowel, therefore, it is false as wel as wasteful : *genuin* is the standard English pronunciation, *genuine* is a vulgar corruption ; *hav* spels the word intended, *have* should rime with *gave*, *slave*, *knave*, etc. We ought to write *imbecil*, *medicin*, *treatis*, *favorit*, *hypocrit*, *infinet*, *definit*, *indicativ*, *subjunctiv*, and the like. Several hundred words belong to this class, in great part lerned terms from Greek or Latin and common to many languages. To scholars they look more natural and scholarly, as the Germans and most of the Europeans write them, without the final *e*.

Somewhat similar is the fifth rule, that for dropping silent *u* and *ue*. There ar many French words in which *u* is inserted after *g* as an orthografic expedient to indicate that *g* has its hard sound. Such ar *catalogue*, *demagogue*, *dialogue*, *pedagogue*, and the like. Occasional strangers of this kind may be receivd as gests, and their foren dress be accépted ; but such a dress wil always hav an outlandish look, and when words ar naturalized that fact should be made to appear in their spelling. *Catalogue*, *demagogue*, *dialogue*, and the like hav long outlivd their time. The *ue* is of no use whatever in English, no more than in German *katalog*, *demagog*, *dialog*,

pädagog. It was a cumbrous contrivance at best, and it seems impossible that any one should desire to perpetuate it and disguise the original Greek as well as the living English in this antic semblance.

Somewhat similar is the fourth rule, by which *or* final is to be written, and not *our*, in *honor, favor, labor*, and the like. There is no question about words derived directly from Latin. They are always spelt with *or*. But a few familiar words came thru French, and had at first French pronunciation and spelling. The controlling difference is the accent, which in French breaks Latin *or* into a diphthong.

The Canterbury Tales begin :

“ Whan that Aprille with his shoures soote
The droghte of March hath perced to the roote
And bathed every veyne in swich *licour*
Of which vertu engendred is the *flour*.”

So, line 45 :

“ He loued chivalrie
Trouthe and *honour*, fredom and curteisye.”

But when the *o* is unaccented it is retained, as in line 22 :

“ To Caunterbury with ful deuout *corage*.”

The *or* in *honor*, and the like, is now unaccented, and, if it were to follow French analogies, should be pronounced and spelt like French *honoré*, not French *honneur*. But all these words have long since been Anglicized, and should be spelt so as to show it, as all Americans spell them and the scholars of England, and as the Romans spell them, and the Italians and Spanish.

The eighth rule directs us to change *ph* to *f* when so sounded.

Can one who has heard Homer sing his *apameibomenos* see *fonetik* or *filosofi* without a shudder?

And yet *fonetik* is the very Greek *φωνητικ-ός*, the natural old form of it in Roman letters; *φύρ* is *fur*; *φάρι*, *fari*; *Fabius*, *Φάβιος*, and the like. But when the Greeklings at Rome began to affect a pure Athenian accent, and retained in words newly taken from Greek the old sound for *φ*, which had been that of *p* followed by *h*, they wrote *ph* in such words to represent their way of sounding it. The fashion past away at Rome. The Italians, like the Spaniards, have returned

to *f*. They write and print *filosofia*. Why should we keep on with the *ph* of *philosophy*, and with the *y*, the elegance of whose final flourish hardly atones for its false suggestion of an old *upsilon*, unless, indeed, it may be said for *ph* that our latest fashion of studying Greek and Latin is an archeological method, and devotes itself mainly to exploring and reviving the minutiae of ancient peculiarities, so as to free our minds as far as possible from the habits and interests of modern life, and is likely to revive again the pronunciation of ancient Athens? The Boston boys talk of Kikero, it is said; perhaps the girls are beginning to discuss P-hilip and P-hidias.

Such are the changes which affect English words derived from Latin and Greek. These can be discussed with confidence. Every one knows enough Latin and Greek to form an easy judgment. Anglo-Saxon is less familiar. It is only within the last twenty years that any considerable number of persons have studied it at all, and there are still comparatively few who know its words familiarly as they do Latin. When it is urged that the *k* should be dropped from *music* to restore it to its original spelling in Latin, or that the *u* should be dropped from *senatour*, every one remembers Latin *musica* and *senator*; and when it is urged that *sulfur* should be written, not *sulphur*, if any one does not remember about the Latin, he will look in his Latin dictionary and see; and his scholarly conscience will utter a categorical imperative in favor of the true classical form. But when it is urged, according to the second rule, that the silent *a* shall be dropped from *feather* and *leather*, or, according to the third rule, that the Anglo-Saxon spelling shall be restored by changing *o* to *u* where the sound is *u*, as in *above*, *tongue*, and the like, no consecrated and authoritative picture of the Anglo-Saxon words rises in the public mind; and even when the public learns that the real word was and is *fether* or *tung*, and admits in reason that *t-o-n-g-u-e* is a queerer freak, a more hideous monster, than *music* or *senatour* or *catalogue*, the public scholarly conscience does not after all speak up very loudly in favor of *tung*. But it will speak up by and by. It has at last been discovered that English is a great language, and worth knowing thoroughly. No good college is now without a specialist in historical English. The generation that is now studying under Professors Child and Kitttridge at Harvard, Lounsbury and Cook at Yale, Bright at Johns Hopkins, Hunt at Princeton, Price at Columbia, Garnett at the University of Virginia, know their native *tung*, as well

as Greek. They ar as redy to restore *tung* as *demagog*, *fether* and *lether* (German *feder*, *leder*) as *zelous* (Latin *zelosus*), or *honor* or *sulfur*.

It must be rememberd, however, that the feasibility of the joint scheme is not to be judged by the rules alone. They ar general guides. But many words wer considered one by one, and the intention was to make a List of amended words to which no objection can be reasonably urged. The common objections to fonetic spelling wil be found to be inapplicabl to the List. An objector may think of a word which fonetic spelling wil change so much that it cannot be recognized at sight: *beau*, for instance. He wil find the word is not in the List. He may think of one in which fonetic spelling wil remove marks of derivation: *phthisic*, for instance, Milton's *tizzic*, Italian and Spanish *tisica*. All such words ar carefully excluded from the List. It is desired not to offend a Greeklng.

But it should be mentiond that there ar many words having silent letters which suggest false derivations; these, of course, ar carefully amended. These, it would seem, all scolars would be in favor of amending. One might think that *island* is from *isle*, Latin *insula*, and so think that *iland* destroys the record of etymology; but in fact the old *iland* has nothing to do with *isle*; the *s* of *island* is pure blunder. One naturally thinks that *sovereign* is from *reign*, and that dropping the *g* wil destroy etymology; that *rhyme* is a Greek word like *rhythm*, and that the old *rime* is a lost child; that *controller* has lost all that connection with *compute* which is preservd by *comptroller*; that *sulfur* and *ake*, hav lost the record of their Greek origin which is preservd in *sulphur* and *ache*; that the old English *beuty* has forgotn that it came from *beau*, and so on; but all these ar misleading blunders in etymology and history. The amended forms wil generally be found in the List. But not all words whose correction is desirabl and whose corrected forms ar easily recognized ar put in the List; many concessions ar made to old associations. Words and forms which occur very often and whose change would therefore be very obtrusiv ar for that reason omitted: *iz*, *of* (*ov*), and inflection forms in *s* like *dogz*, ar not in the List. In making these concessions to prejudice there is room for difference of opinion. A critic may say: *iz* is left out, why put in *ar*? Wel, for one reason, it helps correct a bad pronunciation, as *engin* or *genuin* does; many persons say *air*. But no two per-

sons would make exactly the same concessions. The decisions turn upon difference of degree, and must be made, as they have been, by the average judgment of a select committee.

It is plain from all this that there are no such difficulties in the use of this List as make complete fonetic spelling impossible. It should not be judged by a general look at the long columns as they stand together in the dictionary. These may look as tho everything was to be changed; but there are 250,000 words in the English language. The result of the changes should be judged from common printed pages in which the new rules have been followed. The total changes will then be seen to be similar in kind to those found in the authorized editions of the Bible of King James as compared with Spenser and Shakespere, or to those of the Webster period, which simplified the *ick*, *our*, *ll*, and the like, of Johnson. The change in a printed page will not be greater than these familiar changes, which now we hardly notice. Such eras of improvement in spelling have marked the progress of our language from the first. The action of the philological societies marks another epoch.

Half a century has past since the Webster epoch. What changes have taken place during this period! What progress in the arts and sciences, especially in those which promote speedy communication, which draw mankind together and make them one family, needing one language, which tend to make them one English-speaking family!

Nearly twenty years have past since the American Philological Association entered on this work. A report has been made every year from its committee of representative scholars. The first report described the ideal spelling at which reformers should aim. The second gave an ideal alphabet for pronunciation in dictionaries and the like, and to guide in making a list of amended words for immediate use. The third reported eleven words to begin the list. And so the action has gone on. It has been slow enough, one would think. It has past through all the stages that the most conservative have suggested. They said in 1875, "We will accept any changes that the American Philological Association will recommend." In 1878 the association recommended the eleven words. Then they said, "When the English Philological Society joins we will follow." In 1883 that society united in joint recommendation of rules of amendment. Then they said, "Make us an alphabetical list of words that we can use." It was done in 1886. It was then said, "We must

hav it in a dictionary ; let it be printed in a current dictionary and it shal be our authority." In 1891 it appeard in the most authoritativ form in the Century Dictionary. It is redy for use ; the filologists hav done their part. Their action has been taken *nemine contradicente*. But there is delay. All this action is unknown to the general public. It is simpl, unsensational. The newspapers say nothing about it. But whenever sum quack broaches a ridiculous scheme the funny men of the press make the cuntry resound. The general public thinks that spelling reformers ar wild and hav as many schemes as there ar men, and each more ridiculous than the other ; but, in fact, a fair proportion of the best brains in the world hav labord on this reform. Fonology is the foundation of filology, and the great filologists spend days and nights upon it. English spelling is the opprobrium of English filologists, and there has been and is all the agreement on the reform of it that could be reasonably hoped for.

There ar difficulties about the adoption of new spellings, as in introducing any new machinery. It cannot be expected that business men wil uze new rules in their writing ; it embarrasses even lerned professors ; but a proof-reader can be paid for spelling our books, one proof-reader spelling for a thousand. General publishers find embarrassments in breaking into the habits of their establishments, and they look to general success and immediate profits.

There seem to be good reasons for special appeal to lerned societies like the Anthropological Society of Washington to uze the amended spellings in their publications before their general adoption. They ar natural leaders in such a case. They ar pledgd to the discovery of truth and the improvement of man's estate. Their documents ar important and their form is worthy of careful attention. Their orthografy has great influence as an exampl. Scool books and other publications wil be led to follow it. It wil be sure to work its way into the publications of the Government. The readers of such publications ar persons of unusual intelligence ; they wil not be embarrass by improvements in spelling ; they wil approve a reasonabl orthografy. Especially is this true of the great scientists of other cuntries. From England, from Germany, from the brotherhood of scientists all over the world, a general rejoicing wil arize when publications of lerned societies reach them in reasonably spelt English.

II.

A. R. SPOFFORD.

There are few subjects of wider or more commanding interest to any people than that of their methods of expression. The influence of language is universal—the power of our mother-tongue is all-pervading. So much the more important is it that we should preserve its purity, and guard against any inroads which tend to weaken its historic significance or its poetic power. Such inroads are the attempts recently made to “reform” the methods of writing and printing the English tongue. While none can question the linguistic attainments and the eminence in general scholarship of many of those who have assumed to reform our orthography, it may well be doubted whether the world of letters owes them any debt of gratitude. The ingenuity expended upon the many conflicting schemes for providing us with a new English alphabet, if devoted to the elucidation of the history, uses, and variations of existing words, might have been productive of results of more practical value. Recognizing fully the fact that all language is a growth, and that a living language must suffer constant though gradual changes in its vocabulary and expression, it still remains true that no language—at least no language having a literature—was ever formed or reformed by any such radical methods as those proposed by the spelling reformers of our day.

That there is nothing novel in the orthographic reforms now proposed, that precisely similar schemes have been many times offered to the learned world during the last three centuries, only to be rejected, and even finally abandoned by their authors, it needs but brief reference to show. The radical change involved in substituting spelling by sound for our traditional orthography has been too many times proposed and declined to justify its present advocates in any ardent hopes of success. So long ago as the year 1768 the ingenious Dr. Franklin amused himself by inventing a reformed alphabet, in which the letters represented the sounds with strict and unvarying accuracy. Some letters he omitted, and for some sounds he created new ones. A letter to a London lady, printed in the proposed new characters, and explaining the advantages of the spelling reform, appears in his correspondence, and is the earliest

American exhibition of the phonetic system which I have found. Notwithstanding the acknowledged ability of Franklin as a scientific investigator, and the world-wide reputation and influence which he enjoyed, he appears to have made not a single convert to his proposed amendment in writing and printing the English language. We do not find that he seriously proposed the subject to any of the learned societies of which he was a member, and the scheme appears to have been drawn up merely as one of those philosophical experiments which his inventive brain threw out without adhering to, to be speedily abandoned in the test of his eminently practical mind.

The late Noah Webster was not of the same mind for many successive years as to his own innovations. In 1789, in his "Essay on a reformed mode of spelling," he broadly proposed to abolish all superfluous or silent letters, and to spell *bill* (built), *relm* (realm), *giv* (give), *frend* (friend), etc.; also to spell *laf* for laugh, *tuf* for tough, *blud* for blood, and to write *k* in place of *ch*, as *korn*, *kolic*. But he published his first dictionary, in 1806, without these innovations. At a later day he became a zealous propagandist of spelling reform.

It is curious and instructive to note that just one hundred years ago Noah Webster put forward precisely the scheme for getting spelling by sound adopted by the government which was embodied in a resolution before the Printing Committee of the last Congress. "The only steps necessary," said he, "to insure success in the attempt to introduce this reform would be a resolution of Congress ordering all their acts to be engrossed in the new orthography."

I have prepared a chronological summary of the various schemes for simplified spelling by sound which have appeared, from Dr. Franklin's, in 1768, down to Prof. Alexander Melville Bell's notable "World-English" alphabet, published in 1888. They number between forty and fifty in America alone; but I will not detain you by describing them. I omit also a statement of the different attempts to secure the sanction of the Government of the United States to methods of phonetic expression, as not specially pertinent to this inquiry.

It is now more than forty years since the absolutely phonetic scheme of writing known as the Pitman system was invented and applied to print; and although it had a temporary vogue in England and America, and dictionaries, grammars, readers, and even an

edition of the Scriptures were produced in phonetic type, it is now practically abandoned, except for the uses of phonography.

The plausible idea of spelling by sound has to undergo a severe ordeal when reduced to practice. We may call this prejudice, ignorance, obstinacy, conservatism, or what we will; but the majority of the English-speaking race will continue to write their language after the model of the great masters of literature, no matter what plans may be brought in to simplify it. The existing English alphabet is no doubt bad enough, and its combinations into written speech are full enough of solecisms, inconsistencies, and absurdities; but still it is the English alphabet, the only key to a great historic language and literature, and this no device of modern phonetics is or can be.

The failure of all past attempts to revolutionize the methods of expressing our language suggests inquiry as to the cause, and this leads us to consider the expediency of the proposed reform. In the first place, neither the popular sense nor the judgment of scholars (outside the limited ranks of some philologists) has ever lent any sanction to the theory that the language would be the gainer. No great reform, perhaps, was ever proposed in England or America which has met with so meagre a following. The reasons are not far to seek. The very diversity of plans points to a difficulty which alone is enough to defeat the project. We are told of the great merits of *the* phonetic system or *the* phonetic alphabet, when in fact there are forty or more conflicting alphabets, all claiming to be phonetic. Which phonetic system are we to have? Even were competent scholars appointed to bring in a perfect alphabet, it is highly improbable that they would be able to agree upon its constituent parts. Much greater is the improbability that English and American scholars would ever agree to write it after them, and the chances of its adoption by the body of the people are so remote that it may be reckoned among the impossibilities. Dr. Franklin's phonetic alphabet consisted of 26 letters, Dr. Thornton's of 32, Mr. Pitman's of 40, Dr. Comstock's of 44, Mr. A. J. Ellis's of 45, and Professor Bell's of 44.

As all written language consists of an assemblage of arbitrary characters, it is reasonable to conclude that that particular assemblage of characters which has been rendered familiar by centuries of use and by books printed in it amounting now to millions will remain in possession of the field. The attempt to introduce a new

system by report and resolution appears too impracticable for argument. Men accept perforce the objectionable features of the present system of spelling because it has two immense advantages over any innovation: it is established, and it is understood. But how would you secure the use of any new one? Authority being out of the question, and custom being arrayed upon the other side, what means are left for securing uniformity of usage? When the learned committees have met and resolved in their wisdom, "Go to, now, let us make a language," their enterprise might be expected to end in a worse confusion than has been witnessed since that notable mishap which is said to have befallen the builders of the tower of Babel.

But, we are told, no new alphabet is now proposed—only to reform and simplify our spelling with the old one. This proposition is, from the phonetic point of view, a palpable confession of weakness, since it abandons the only possible means of achieving a complete spelling by sound. That means is found only in an alphabet which has an unvarying symbol for every sound, as well as a strictly uniform sound for every symbol. To attempt to reach phonetic results by tinkering with the present alphabet is most illogical, because foredoomed to failure by its own avowed principles. In the vocabulary of about 3,500 words spelled in what is called simplified form with the sanction of the American Philological Association in 1886, and reprinted in an appendix to the Century Dictionary, are many solecisms and inconsistencies which there is here no time to point out. Taken together, these model words all have a cropped, bald, and unhappy look to the average eye.

But the cardinal offense of this and of all other attempts at phonetic expression in the literature of our language is not an æsthetic, but a scientific one. It effaces from a multitude of words that most valuable characteristic feature, the etymology of the language as expressed by orthography. Our English words carry with them in great part, written upon their faces, sufficient traces of their origin. Sweep away the spelling which they derive from their original tongue, and all trace of the derivation of many most significant words is lost. Let a young lady who calls a gallant gentleman a "*beau*" read the word phonetically—thus, "*bo*," and straightway she loses not only all evidence of its French original, but also all traits of grace or elegance or attraction which the original conveys. In like manner, our English word *beauty*, from the same root, if spelled by sound "*buty*," is stripped of all its fine suggestiveness, as well

as of every trace of its origin. Our English word "*pique*," if written by the sound, becomes "*peek*," which leads not only to a confusion of meanings with a wholly different word, but buries out of sight the sharp significance which is contained only in the French original. The same thing happens with *lieu* and its derivative, "*lieutenant*," if spelled by sound; the idea of place is lost in the newly coined "*lu*," which usurps its place. The familiar Latin derivative, "*science*," from *scio*, to know, teaches two languages in one glance of the eye; but what becomes of this rich suggestiveness when it is metamorphosed by phonetics into "*siens*"? The reformer of language who spells *bouquet* "*bo-ka*" may plume himself upon having got rid of three superfluous letters; but he has got rid at the same time of all the aroma which gives to the word its only value. Go through the vocabulary of our noble English speech; see what infinite compass and variety, what wealth of origin it displays, and then say if it is worth the while to destroy all traces of this wondrous richness in order that a few ignoramuses may be facilitated in learning how to spell? When we have stripped this rich, composite language of all its native grace and beauty, and have got, instead of the living flesh and blood of speech, a long array of word-skeletons, the very dry bones of language, from which the soul has departed, it will be a poor consolation that we are able to spell them unerringly.

The vast body of English literature, too, already in print, knows nothing of phonetics. The culture of a people comes not so much from what their children learn at school, as from what they absorb in after-life from the great writers of the world. With all the literature of the language in another spelling, the printing of school books in phonotypy would only introduce a needless confusion. Why should an emasculated dialect be taught in which, as expressed in the new spelling, no literature as yet exists?

The phonetic system is advocated upon the ground that our English tongue is full of difficulties that are the despair of foreigners. But, as the English language was not originally constructed for the use of foreigners, the necessity of reconstructing it for foreign use and benefit is not apparent.

As for the argument that under the present system everybody must waste a deplorable amount of time in learning how to spell, the answer is plain—that every one who can learn to spell by sound needs but small additional expenditure of intellect in order to spell

by the present method, which is preponderantly that of sound. The time spent in learning the accurate spelling of our present language, is quite as profitably employed as that which would be consumed in learning the strange medley of contradictions to which we are introduced by the phonetic system. When the spelling reformers have got it established that *rite* and *right* and *write* and *wright* are all to be written *rite*, the learners of our language will be relegated to a chaos in comparison with which the present anomalies of speech are cosmic order. Nor is there any danger that the school boy, whose hard fate in being compelled to commit to memory long rows of contradictions in spelling is so plaintively deplored, will find any royal road to learning that will spare him his wholesome exercise of brains, even should a phonetic system be once established. The child who cannot spell *quadrille* with nine letters would in all probability find it difficult to spell it with seven. If a human being has the misfortune to be born a blockhead, it is not in the power of any philological association to furnish him with an understanding.

This change is advocated on the ground of consistency and of uniformity, but it is inconsistent with itself, and yet more irreconcilably inconsistent with the principles of pure phonetics. Carried to its logical conclusion (which its present advocates seem to hesitate to attempt), it would abolish the greater part of our accustomed forms of speech in favor of a Procrustean uniformity. There is a class of men addicted to science (I do not say that all spelling reformers are of them) whose hobby is to construct everything upon right lines. Had they been consulted in the creation we should have had, not the infinite variety, the marvellous redundancy which we now see, but we should have had a rectangular universe. Every object would have been tamed down to a strict and consistent pattern, if not toned down to one color; nothing wasteful or superfluous would have been tolerated, and the place and function of everything and everybody would have been fixed by geometric laws. Like the Gradgrinds of Dickens's story, who were bent upon crushing all the poetry out of life, they would willingly banish all the picturesqueness out of language. Fortunately for mankind, this was not the genius which presided over the evolution of our globe. Not uniformity, but endless diversity, is the everywhere apparent law of nature. Of all the myriads of human creatures, no two were ever made precisely alike, since the world began. Every flower that blows is a pleonasm, every tree and shrub swarms with

redundant blossoms. Nature, through all her realms, delights in paradoxes and revels in superfluities.

They complain of our language that it has many superfluous letters, and want to get rid of all the silent ones ; but these unuttered vowels and consonants have a mission, and that mission is to reveal, in thousands of words, their true source and fountain-head. As Emerson said on another subject, so we may say of these silent letters, " their silence answers very loud." They furnish often the only key to the full sense and significance, as well as the origin, of our words ; but the spelling reformers would throw away the key.

The fact that spelling by sound has made such marvellously slow progress during the many years since it was first proposed, and that, too, among the most progressive nations on the globe, America and England, should at least teach modesty to the learned advocates of the innovation. In an age of unparalleled progress in all practical improvements, why tarry the chariot wheels of the phonetic revolution ? May it not be because it is not a practicable reform ?

Of all the advocates of phonetic spelling, how many, it is pertinent to ask, ever spell by sound in their own correspondence ? Probably not one in ten. Yet, if they have the courage of their convictions, why should they not confirm their precepts by their own example, thus working (each from his own centre of influence) to abate prejudice against the system, and to carry into practice at least the dropping of silent letters ? Why doesn't their charity to this much-vaunted improvement begin at home ? Why come to the learned societies, and to Congress (Heaven save the mark !) to help them pull their orthographical chestnuts out of the fire ? When they are ready to prove their faith by their works, it will be time enough to ask us who have no faith to conquer our prejudices. If I really believed in the principle of spelling by sound, I would spell by sound, even though it made the hair of the Anthropological Society stand on end.

We who stand against this reform oppose it not because it is new, but because it is only an old theory revived, and already and always practically rejected upon grounds deemed sufficient by the great majority of scholars. No system of reform, so called, of the language is likely ever to be adopted which is put forth by any body of scholars, whether self-elected, or commissioned by vote of a legislative body. The experience of the past proves how nugatory is

the influence of theorists and doctrinaires in spreading among the people the use of changes in their written language.

The New York *Tribune*, under Horace Greeley, following Webster in his orthographical vagaries, used to spell height *hight* (why not *hite* ?), and introduced many other elisions of superfluous or silent letters into its columns; but the "reform" lasted only a short time, and the *Tribune*, for twenty years past, is printed as other journals and books are printed. Ten years ago the Chicago *Tribune* cut off the tails of many English words, spelling *thoro* for *thorough*, etc., and kept up the innovation for a time, in spite of the ridicule of its contemporaries; but that journal, like its New York prototype, has returned to the established orthography of the language.

As if by common consent, the art of spelling by sound has practically been left to such pseudo-comical writers as Artemus Ward, Josh Billings, and the Rev. Petroleum V. Nasby, whose grotesque compositions, after the model of Thackeray in the Papers of Jeemes Yellowplush, are read with amusement not unmingled with disgust at their orthographical absurdities.

The cardinal error of the spelling reformers is,—they forget that the language of a people is an evolution, not a creation. While the English-speaking race will gradually accept changes which commend themselves to reason, and will give to them the force of usage, no measure can meet their favor which, like the sweeping changes of the phonetic system, so closely approaches to the subversion of the English language.

III.

W. T. HARRIS.

The irregularities of English spelling are too well known to need more than brief mention. According to Mr. A. J. Ellis, the distinguished specialist in the pronunciation of Old English, the letter *a* is used to represent eight different sounds; *e*, eight; *i*, seven; *o*, twelve; *u*, nine; *y*, three. Twenty-one consonants have seventy sounds, averaging three and a third apiece; but while there is much difficulty in determining the proper pronunciation from the spelling, it is still more difficult to ascertain the proper letters with which to rep-

resent the spoken word. The sound of *e* in *be* has no less than forty equivalents in the language; *a* in *mate* has thirty-four. Mr. Ellis has shown that the singl word *scissors*, which is composed of six elementary sounds (*s*, short *i*, *z*, short *u*, *r*, and *z*), could be speld in a vast number of ways; for exampl, the person familiar with the words *schism*, *sieve*, *myrrh*, *visor*, *scourge*, *suffice*, might spel the word scissors *schiesourrhce*. The fact that one is never quite sure of the pronunciation of a new-printed word he has only herd pronounced and not seen in print is sufficient to prove the illogical and capricious character of English spelling.

In the last century Dr. Franklin wrote a paper on the subject that is markt with his eminent good sense. In the first half of the present century Noah Webster, the pioneer of American lexicographers, repeatedly urged the same reform. To him is due the fact that American spelling differs slightly from the spelling in England in such words as honor and traveler.

If, however, the spelling reform wer merely a matter of logical consistency its claims would not entitl it to much attention. The strong ground is that of saving the time of those who hav to lern how to write the language and read it, and a saving of expense to all who hav to buy or make books. One-sixth of the population of the cuntry is foren born or from foren-born parents. The importance of an easy method of teaching reading to this class of our population is obvious. About fifteen per cent. of the cost of type-setting and of press-work and paper would be saved in books and periodicals if the reform wer adopted.

The saving of time in lerning to read and spel is a matter of even greater importance. Very few adults can write a long letter without making a mistake in the spelling of sum word. Dr. Morrell, one of the English inspectors of scools, reports that out of 1,972 failures in the civil service examinations in Great Britain, 1,866 candidates owed their failure to poor spelling. Dr. Hagar compiled the results of the examination in spelling of one thousand candidates for admission for a state normal scool in Massachusetts. They wer proposing to becum teachers, and yet these yung wimen averaged only eighty per cent. of correct spelling in the examination in that branch. Upon an average, one word in five was misspeld. This indicates fairly the obstacle in the way of scholarship. In order to attain to a high degree of excelence in spelling, many years must be

devoted to the study and practis in writing the difficult words of the language, and a corresponding amount of time taken from studies in science and history and literature.

Experiments hav been made in different parts of the cuntry sinse 1845 to ascertain the amount of time required to lern to read the English language when printed in a fonetic alfabet. The average results hav shown that about two years may be saved in lerning to read by the fonetic method. These two years ar taken from the time which might be givn by children to lerning history, geograpy, science, and literature, and it is wurthy of mention that the president of Harvard University, who has investigated the rate of progress on the part of students in the high scools of France, finds them at a givn age, say, fourteen or sixteen, to be two years in advance of American youth in regard to substantial studies in literature and science.*

In 1866, in St. Louis, an experiment was made with a modified alfabet invented by Dr. Edwin Leigh. The silent letters in the language wer printed in hair-line type (skeleton type), the other letters wer printed in type of a modified form, showing by the modification the sound of the letter uzed. This alfabet of modified letters amounted to sum seventy or seventy-five characters, but when the sound of a character was onse lerned the child on seeing the letter again coud be sure that it represented the same sound as before. Previous to the introduction of the new alfabet the children required a year to finish the First Reader and another year to finish the Second Reader. No child began the Third Reader before the third year. With the new alfabet two books wer printed insted of one (a primer and a First Reader), dubling the amount of reading matter. One hundred and fifty primary teachers commenced teaching the books printed in Dr. Leigh's type at the beginning of the year, and in ten weeks' time all reported the primer finisht and wel lernd. A second ten weeks finisht the First Reader with similar thoroness. In the second half-year the entire Second Reader was finisht by many pupils and at least one-half of it by all. The bright pupils, who wer promoted from class to class and not kept back for the dul pupils, wer found to be abl to complete in the first year the primer and First Reader in Leigh's type and the Second Reader and one hun-

* See Proceedings of the National Association of Educational Superintendents, 1888.

dred pages in the Third Reader in the ordinary spelling. This showed a saving from one and a half to two years in learning to read. It was found, moreover, that these children not only learned to read rapidly, but that they learned to spell the ordinary spelling much more correctly than other pupils. This was due to the fact that they noticed the silent letters more carefully. The children learned logical habits of analysis and were more intelligent in regard to the meaning of what they read than others. This system was used about twenty years under my observation, and is, I doubt not, still in use in St. Louis. It was noted that the children found learning to read so easy a task by Leigh's method that they took more pleasure in reading books and newspapers at home, and yet Leigh's system would be called a very difficult method of learning to read as compared with any perfectly phonetic alphabet; for the phonetic alphabet for English should have only forty letters, while Leigh's alphabet had more than seventy. Leigh's alphabet was intended only as a transition alphabet, to be used in learning how to read the ordinary spelling. It was seen that the child could learn the forms of words by the phonetic system first and then recognize the words in their ordinary spelling by their general resemblance to the words printed phonetically.

American children are thus weighted with the heavy load of learning the spelling of words written without regard to any consistent system. It is not strange that they are not able to make so rapid progress as German, French, and Italian children, who are taught consistent systems of orthography. It should be mentioned that the spelling of the Spanish, French, Italian, and German languages has been modified from time to time and simplified by national academies or commissions of learned men acting under government sanction.

The effect of the teaching of English spelling has been in all English-speaking nations to force the primary education into the work of verbal memorizing. In China a separate character of complicated shape must be learned for each word; hence Chinese learning is proverbial for the stress it lays upon verbal memory. Next to China among the nations stand the English-speaking nations as regards the stress which is laid upon verbal memory in school. All great educational reformers who have looked into the methods of instruction in English and American elementary schools have condemned the amount of memory work which they have found and called attention to the smaller amount of thinking and investigation which

is secured by the training of the average elementary school, and it is claimed by the advocates of the spelling reform that this radical defect in our schools is occasioned solely by the irregularities of English spelling and the consequent severe labor of the child in acquiring a sufficient knowledge of the forms of words to enable him to read and write.

In the last generation when the English spelling reform began to be agitated it was contended by the scholars and directors of higher education that great advantage lay in the present mode of spelling; that our spelling preserves in each word some clue to the history of its adoption into the English language. More careful investigation on the part of philologists has, however, discovered that these historical clues do not so much relate to the true derivation of our words as to the attempts on the part of the schoolmasters of the seventeenth and eighteenth centuries to indicate by the form of spelling such derivations as were currently supposed to be historical. Scientific philology has found that a large proportion of the supposed derivations are unhistorical, and that a strictly phonetical spelling of the English language indicates the history of its words more accurately than does the ordinary spelling. The caprice of the Norman scribes who picked up the Anglo-Saxon language without any proper knowledge of its origin led to very absurd combinations of letters to represent words which they were scarcely able to pronounce correctly. Prof. Max Müller of Oxford has said that "if our spelling followed the pronunciation of words it would in reality be of greater help to the critical students of language than the present uncertain and unscientific mode of writing." In this statement he is followed by the Philological Society of London. The American Philological Association has taken the same position in regard to the value of our present method of spelling and has declared a reform to be highly desirable. The names of Professor March of Lafayette College, Professors Whitney and Trumbull of Yale College, Professor Child of Harvard College, and Professor Haldeman of the University of Pennsylvania stand side by side in the advocacy of this reform with the names of the great English scholars, Sayce, Murray (editor of the New English Dictionary in thirty volumes), A. J. Ellis, Max Müller, Dr. Angus, Mr. Gladstone, and their coadjutors.

Notwithstanding this the selection and adoption of a phonetic alphabet is impossible by any agency known to the English-speaking

people. The principle of local self-government prevails wherever Anglo-Saxon is spoken and there is a jealousy on the part of the people with regard to the use or usurpation of dictatorial powers; hence neither national nor international commissions can be expected that will decide upon the question of a particular alphabet and fonetic spelling. The method by which reforms are brought about in English-speaking countries is therefore that of a gradual process of growth; a very small item of reform is recommended and brought into usage by degrees.

The English and American Philological Societies, composed as they are of very conservative men, have united in recommending a few emendations to the present mode of spelling. The most important of these relates to the dropping of the silent *e* in words where it is at present misleading. There is something of logical reason in using the silent *e* at the end of words in order to indicate a long vowel in the same syllable. For example, we distinguish the short sound of *a* in *hat* from the long sound of *a* in *hate*, etc. But it is inconsistent with this reasonable usage of the silent *e* to place it at the end of words with short vowels; for instance, the word *live* with the short *i* should be spelled without the silent *e*. So all of those words ending in *tive* in which the *i* is short.

Proposing slight changes in spelling to make the present system of spelling more logical and more nearly fonetic, the Philological Society has, through its committees, taken great pains to prepare a few rules which if adopted will advance the cause of fonetics a very much larger step than was made (through the influence of one man—Noah Webster) in the first half of this century. Other recommendations relate chiefly to the dropping of those silent letters which are not only useless but misleading in regard to the pronunciation like those mentioned, or in regard to derivation (etymology).

Sum of the best new dictionaries are leading the way in this reform by giving the new spellings recommended by the Philological Society as alternatives. Of course all changes in spelling look odd at first and are more or less offensive to the eye. But a few years of familiarity with the new form of spelling entirely remove this objection. Such words as *music*, *physic*, and *public* were formerly spelled with a *k* (musick, physick, and publick), but the old spelling now looks as offensive to the eye as the new spelling looked fifty years ago.

IV.

ALEXANDER MELVILLE BELL.

I suppose we may assume that all admit the anomalous character of our spelling and the need of some improvement. The question to be decided is, how much amendment is advisable, how much is feasible, and how is it to be accomplished?

Some would make a sweeping change that would not need revision, by adopting at once a uniform phonetic system; others would introduce improvements piecemeal and spread the work over generations.

When a thing has to be done, it certainly should be done well; and if a change could be carried out with completeness, so as to be "*done* when it is done, then 'twere well it were done quickly."

Change unsettles the mind, and is, therefore, in itself to be deprecated. The most trifling change has this effect equally with the most important. A single change, however great, is much more easily made than a series of small changes. In making a piecemeal change you have the same battle to fight at every step.

In reference to spelling reform, my counsel would be: Present the whole scheme at once, that its rationality may be seen and its advantages theoretically recognized; but make no attempt to introduce it popularly, piecemeal or otherwise, except in the *public schools*. There give the pupils the full benefit of it. Then you may leave those children, when grown up, to choose for themselves either the phonetic or the literary spelling for their daily use. They will have command of both systems.

The object of writing is to be *understood*, and this obviously does not require uniformity in spelling. We can understand well enough the most diverse use of letters. There is a good deal of practical sense, therefore, in what I have heard seriously maintained—namely, that there is no need to spell in any particular fashion, but that every person might spell phonetically—as he pleases.

Look into the first folio of Shakespeare (1623) and you will find the words *be*, *me*, and *he* spelt sometimes with two *e*'s, sometimes with one; the word "been" varies to *bene* and *beene*; the word "do" is either *doe* or *doo*; the preposition "to" is generally *too*; the words *till*, *well*, and *bell* often have but one *l*; the word "murder" is sometimes spelt with *d* and other times, on the same page,

with *th*; the termination "less" is sometimes *lesse* and sometimes only *les*; the word "stop" has in some cases two *p*'s and an *e* (*stoppe*), and in other cases only one *p* and no *e*—as we write it.

In Shakespearian spelling silent *e* is written in thousands of cases without any function, although occasionally it usefully distinguishes a long vowel, as in "cape-able," which we write "cap-able," while we pronounce it *cāpable*; also in "inde" for the sound in *kind* and *behind*, which, for want of the *e*, we practically write *kind* and *behind*.

Double consonants are usefully written to denote short vowels. Thus Shakespeare gives us two *r*'s in *paragon*, two *d*'s in *widow*, two *m*'s in *coming*, and two *l*'s in *general*. Shakespeare writes *whipped*, *dropped*, &c., with *pt*, which is all that we really pronounce. Tennyson does the same. Why does not everybody? Shakespeare inserts *d* in the word "hinge" (*hindge*). We write this same sound sometimes with *dg*, as in *edge*, *lodge*, and *bridge*, and sometimes with *g* only, as in *age*, *allege*, and *college*.

Orthographic consistency was no part either of Shakespeare's practice or of the general practice of his day. Is not the same liberty still allowable to us? Printing has accidentally given fixity to our present style of spelling, although the latter is not at all adapted for perpetuity. We need not, therefore, hesitate to make any desirable changes. In fact, if we are not to say to learners, "Spell as you please!" we must provide a *consistent* use of letters for the standard spelling we wish to establish.

Before spelling can become a proper subject for school discipline or reproach it must be made *rational*. The observant eye, which alone makes a good speller now, is not to be ranked with excellence of scholarship, nor is the failure of the eye to observe accurately to be treated like negligence of study. We make too much of spelling. It is not worth the time spent upon it.

The experience of all who spell well will, I think, be found to be that spelling never gave *them* any trouble. At *sight* of a word it was recognized as right or wrong. We should, therefore, be chary in attaching too much demerit to bad spellers, who have, as a rule, bestowed more pains on the subject than good spellers have ever given.

The Rules for Amended Spelling, approved by the Philological Society of London and the American Philological Association, go but a very little way toward the needed improvement. They amount simply to this one rule: "*Omit all phonetically dispensable*

letters." We must ultimately add a second equally necessary rule: "*Give every sound a uniform representation.*" If we stop with the first rule our work will be comparatively worthless. The first is only acceptable as a step toward the second rule, and the latter involves the necessity for an extension of the alphabet, to furnish letters for unrepresented sounds. You *cannot* escape this necessity. Without such new letters your work will be "never ending, still beginning."

Show me a scheme which is simpler than that introduced in "World-English," or which makes less alteration in the familiar aspect of words, and I shall advocate it with a hearty preference.

World-English, however, is merely an expedient by means of which present spelling can be *retained*. I sympathize with those who are jealous for our existing word-pictures, and World-English is the expression of that sympathy. Any reader of common letters reads this phonetic arrangement of them almost at first glance, and a person who has learned to read from World-English will have corresponding facility in deciphering what may now be called Literary English."

The same facility was attained by means of the phonotypic system of Pitman and Ellis, published some fifty-odd years ago. That system wanted but little of being perfect for its purpose. It earned the right to adoption by high and uniform success, and it has left a monument in the Phonetic Bible of which any phonetician may feel proud. But it was killed—by prejudice.

Children and foreigners should begin with a phonetic system such as World-English, and they need not go beyond it except for literary purposes or for higher education. They will have full command of the language without any bother with the intricacies of spelling. If our present orthography were to be displaced by a perfectly phonetic system, World-English would have no *raison d'être*. Ordinary English would then be "World"-English—that is, would be adapted to the world's use. Meantime this phoneticized arrangement of common letters facilitates the learning of our language at home and its diffusion abroad, while, at the same time, all the venerated *forms* of our words as embalmed in our literature are preserved unchanged.

A system of this intermedial kind should be welcomed even by objectors to spelling reform; for none can be so blind as not to see the need of some means of lessening the labor of learning to read.

One objector last week had what I must call the hardihood to say *in effect* that spelling reform would be only a concession to *dunces* and to foreigners, who, he asserted, had no claim to our consideration! Why, the English language will ultimately be the international language of the world—the common property of all nations—and therefore the rights of foreigners to a reform of English spelling are as great as our rights to the use of the language as our vernacular. Established spelling is altogether fortuitous. It is not a result of scholarly design for which we ought to feel respect. It has not been trimmed into shape and guided in growth by intelligence, but it has spread itself over our literature as uncared for as a weed. We have reason to be ashamed of such neglect.

One of the speakers last week called attention to the confusion which would arise from the phonetic writing of such words as *rite*, *right*, *write*, and *wright*, which are all pronounced alike. We have precisely the same confusion now to the *ear* when these words are spoken as we should have to the *eye* in their phonetic writing. It is no doubt unfortunate that such homologues should exist, but they do exist in the language, and we have to trust to context to unriddle the ambiguities. In one case we have uniform *sound* with different meanings, and in the other uniform *spelling* with different meanings. The confusion is merely transferred from one sense to another. It is exactly the same in both cases. We should have no more difficulty in assigning to each word its separate meaning from writing than we now have in doing so from speaking.

Let our unphonetic friends pronounce words as they are spelt and we shall be satisfied. All we want is to spell as we *pronounce*, and we shut up opposition by calling on the opponents of spelling reform to pronounce as they *spell*.

The question we are invited to discuss is as to the feasibility of adopting the rules recommended by the philological associations. There could not be the slightest difficulty *if*—ah! that vitiating particle in which Shakespeare says there is much virtue—*if* Congress would but enact that the rules shall be applied in printing the public documents of the Nation! No compulsion to be laid on any one but the Public Printer; the press generally to follow or not the example, as might be deemed fit by its individual members or their patron readers. The difficulty involved in this “if” is too great to leave much room for hope. When we find such a radical opponent to the phonetic principle as the brilliant and scholarly Librarian of

Congress, we may well fear his hostile influence among those whose judgment he professes to voice, for he sneers at the very idea of congressional action in this matter. He should know whereof he speaks; but the honor of Congress requires us to hope that he is wrong. Does the honorable Librarian mean that the subject is *beneath* the notice of that august assembly? A subject which has been deemed worthy of the consideration and action of such bodies as the philological associations of Great Britain and America is not to be scouted in this way. The question of simplifying the teaching of our language demands attention from all intelligent persons, and especially from those who are in a position to give legislative effect to their conclusions.

This subject was brought before the House Committee on Printing last year, and on that occasion I summed up the chief recommendations of the amended spelling proposed. The first recommendation was:

"Economy of Time."—Phonetic initiatory systems have been largely tested during a number of years, and the result has uniformly been a saving of not less than fifty per cent. in the time required to make good readers.

The second recommendation was:

"Economy in Printing."—The saving in expenditure for paper and labor from the use of simplified spelling is calculated at seventeen per cent. This economy cannot be considered unimportant, when we reflect that we now waste nearly one column in six in our newspapers, one page in six in our magazines, and one volume in six in all our works of literature.

The third recommendation was:

"Rationality in Teaching."—The want of correspondence between letters and sounds stultifies children and hinders the development of their reasoning faculty. We might as well allow a fluctuating value to the numerals 1, 2, 3, &c., as to the alphabetic letters.

The fourth recommendation was:

"Simplicity and Practicability."—As an instalment of spelling reform the scheme proposed is entirely unobjectionable. Every change consists merely in reduction of the number of letters used in spelling; it is consequently a simplification. We who can use the old orthography have nothing to learn in connection with the new. We have only to dispense with superfluities.

The fifth recommendation was :

"Ultimate Perfectibility."—A scientific scheme would necessarily include new letters for unrepresented sounds. The introduction of these is not contemplated in the present movement. The measure proposed will still leave half a language, full of anomalies, but it will facilitate their ultimate removal, while it will not create difficulties to stand in the way of future progress.

The sixth and last recommendation was :

"Justice to the Young."—Children are condemned to a positive wrong when they are subjected to an unnecessarily prolonged and severe task in order simply to acquire the use of the instrument of learning. The helplessness of the victims of this wrong should be one chief recommendation of such a measure of redress as that which is now proposed. Besides, the time saved in learning to read will be so much added to that for acquisition of knowledge.

The one impediment to orthographic reform is simply—prejudice. I repeat this statement with a full recollection of the fact that one eloquent speaker last week, and another, equally forceful, denounced the phonetic *principle*. They did not condescend to argue against it. They simply denounced it as opposed to—prejudice! And there is no harder argument to answer; there is no argument so unanswerable as prejudice. Spelling reformers were taunted with having accomplished so little, and with lacking the courage of their convictions in not practising the amended spellings in all their business and letter writing; in other words, with not defying prejudice and adopting changes which no private efforts can establish. Our policy has rather been to endeavor after concerted action, so as to give more than individual authority for the amendments we might be disposed to approve. In society each man is not a law unto himself; he must do as others do, and cannot hope to singly stem the tides of prejudice.

Still, perhaps the speaker was right in drawing our attention to the force of *example* which each of us individually can exercise. If we fail in getting the desired endorsement of our plans—which is worth striving for mainly because it would make our efforts so much more speedily effective—we can then, at all events, remove the reproach of inconsistency by entering into a mutual league for the practice of amended spelling. This might, however, practically amount to "spell as you please!" but even that would be better than "spell as you do not speak!"

To my mind there is something grand in the opportunity presented to the people of the United States to make a *national* reform in the writing of our immortal tongue. In this land of magnitudes there does seem something petty in the proposition merely to discard silent letters while there is a much greater work imperatively required. PHONETICISE THE LANGUAGE THROUGHOUT! Here is an object that may well appeal to national pride. Let the method you adopt be distinctively American, independent of precedent—thorough, complete. The result will be an international American language!

The plan proposed of introducing amendments through the Public Printing Office would be an excellent one if the Public Printer could be instructed to carry it out. The plan would be desirable, both on account of its feasibility and of its probable efficacy as an example. It would, besides, be equally applicable to any scheme that might be adopted, whether for complete or for partial phoneticism. No private efforts could effect so much in a decade as would thus be attained in a day. In fact, no private action would *ever* command the universal and respectful attention which an act of Congress would secure. Spelling reform must be established by some official means, or not at all.

On the principle that "a half loaf is better than no bread," we may, perhaps, with judicious prudence, limit our first request to Congress for its edict to drop useless letters from our public printing. The next generation will ask for the needed supplementary letters, and the next for completion of the phonetic scheme by giving every sound a uniform representation.

At the commencement of my address I indicated what I conceive to be the best *practical* method of dealing with this question—namely, to provide a single *separate* system for beginners and to leave ordinary spelling, "with all its imperfections on its head," for the consideration of those new generations who shall have been trained in the phonetics of the language. They will make short work of the objections that now bar the way to all amendment. Prejudice will then act in favor of instead of against RATIONALITY IN SPELLING.

P. S.—At the concluding meeting of the Symposium the Hon. A. R. Spofford, Librarian of Congress, explained that his reference to the hopelessness of official action was based on the restricted

functions of Congress in regard to such matters! If a subject of such universal concern as the national use of letters does not fall within the scope of the national legislature, it certainly should do so. Whence, else, can any official action originate? This subject is preëminently worthy of the attention of Congress, and Congress can, if needful, give itself the power to deal with it.

V.

JOHN M. GREGORY.

I am not anxious for any victory in the argument in this debate, simply because I feel no fear of the ultimate triumph of the reform. It matters littl how we assail or defend the movement in progres, the forces at work in it wil surely carry it to succes. A century ago only Franklin and Noah Webster and a few unknown followers advocated the improvement of our orthograpy. Now the two great national filological societies, embracing hundreds of the ablest linguists of the English-speaking race, ar boldly denouncing our spelling and hav agreed upon hundreds of changes which they believ feasibl and desirabl. We ar told that the failure thus far of the reform is a proof of its impracticability; but this failure, if failure it be, proves at most only the difficulty of the enterprize. But the persistence of the idea and the constant rize of new and more competent reformers prove that there is a great truth at the bottom of the reform, working its way out with resistles energy.

But has there been any failure? Is a science or an art a failure because it does not go at a singl bound to its final conclusion or to the ultimate perfection of its proceses? A cause that shows a constant increas in its frends, and in place of a solitary Franklin or Webster exhibits an array of the finest scholarship of the age, surely is not a failure. Nor has the work of the reformers been itself a failure. Many changes hav alredy been accomplisht. In my boyhood we speld *musick*, *publick*, etc. When the caudal *k* was dropt everybody said: "How queer it looks." So also we speld *honour*, *labour*, etc., and the English hav not yet got over their trubl at our cutting out the *u*. We ar now geting uzed to the new spellings *tho*, *altho*, *program*, *catalog*, etc., and soon nobody wil care to replace the useles tail letters on these words.

In an age which has improved or replaced every tool of its industries, and every vehicl of transportation and travel, it is folly to suppose that inteligent and practical men wil forever consent to retain the cumbersum and blundering orthografty which loads the instrument of thot, the vehicl of that largest comerce known to mankind—the comerce of ideas.

Of the four chief arguments for the reform—(1) the economy of printing; (2) saving childhood from the drudgery of lerning an absurd orthografty; (3) sparing teachers the drudgery of much needles and difficult teaching, and (4) the wider spred of inteligence, I care only to emphasize the second. Think of the task put upon children at the threshold of their education! Call them “blockheds” if you wil, but remember the stultification of inteligence and the stupidity we engender by setting every child to lern by a mere act of verbal memory the senseles spelling which owns no law and carries no light! It is enuf to make blockheds of the best and brightest. Of the few precius years that most of our children can giv to education, what an outrage it is that they must spend two years of time in drudgery as fruitles as it is needles.

But there ar two other arguments uzed by scolars in favor of the reform: (1) the rectification of our etymologies and (2) the wider spred of our language among foren peples. I leav the first of these arguments to such men as Profesor March and Max Müller, who can speak with authority upon it, but I hav a few words to say about the other.

I was surprized to hear our friend, the brilliant librarian of our great national library, whom I regard as the prince of librarians and one at whose feet I am glad to sit when the great relm of books is in question, say with sumthing like scorn that “our language was not made for foreners;” and so I suppose we need not care how serious the barrier that our anomalus orthografty raizes to their acquisition of the English. Is there a man among us whose hart does not swel with gratification when he hears it stated that the English is the mother tung of over a hundred milions of the inhabitants of the erth, while no other of the languages of the civilized peples can claim more than sixty milions; and that the English is rapidly becuming the language of comerce and of civilization? Is it of no interest to us and of no consequence to the world that the language which boasts the purest if not the brightest literature of the world is spreding so widely among the nations of the world, even

in spite of its difficult orthography? How much more rapid would be its spread if its spelling answered better to its pronunciation?

The extension of their national speech is of interest to other nations if not to us. In Germany there is a society which claims a membership of seventy thousand which has for its object the keeping alive of the German language among their emigrant countrymen and the extension of it thru the world, and the question of frequent debate in Europe is, Which language is likely to gain the supremacy? While residing in Paris, a French professor told me of a then recent international meeting of scientists, which during one of their social evening sessions discuss in a friendly way the mooted question of the court and commercial language of the future. Each delegate set forth the excellencies and claims of his own mother tongue, and, among others, an English-speaking representative of England or America enumerated the advantages of the English. He described its richness of vocabulary, its power of assimilating borrowed words, the simplicity of its syntax, the absence of inflexions of its nouns, and of gender in its adjectives and articles, its power of expression in poetry, oratory, and science; the wealth of its literature, and its rapid spread as the language of two of the greatest commercial nations of the world. When he had finished a French savant said: "I recognize the force of all you say; but will you please tell me how you pronounce b-u-t?" The Englishman pronounced it. "Well, how do you pronounce p-u-t?" It was pronounced as we all know how. "Ah!" was the response, "a language that does not pronounce as it spells and spell as it pronounces more nearly than that can never become the universal language." The sore spot in our language is too well known to the whole world.

It is affirmed that though the changes now proposed are comparatively few, the intention of the reformers is to go the whole extent and introduce a complete fonetic system—a system which, if introduced at once, would be open without doubt to the charge of spoiling the legibility of our present libraries and compelling us all to learn again the art of reading. Of course the ultimate aim and complete finish of the reform would be a perfect fonetic system of spelling our language. We all freely admit this; but it is unjust to hint that the eminent filologists who advocate this reform are insincerely concealing a part of their intentions, or that they are so foolish as not to know that all changes in a living language must be made by slow degrees.

But, it is askt, if the reform is desirabl, why not go to the end at onse? To this I anser, a writn language has two distinct constituencies—the adult generation who hav alredy lerned to read it and the children who hav not yet lerned its printed forms. Both of these constituencies hav their rights, which must be preservd—the first, not to have their lerning spoild and their reading inhibited by such changes as would make the new books illegibl to them, and the others to hav such practicabl reforms made as may lighten as much as possibl the task of lerning to read. The changes now proposed by the filological societies would accomplish just this. They woud change so litl the printed page that the old could stil read it with ease, while they woud remove a large part of the rubbish which now lies in the path of the yung lerner. The cuming generation woud be abl to make a similar step forward, and so, ultimately, in the course of a few generations the hole reform might be accomplisht.

To the most common objection, that fonetic spelling woud spoil the looks of the language and rob the printed word of the fine literary and historic associations which sum of us hav lerned to attach to it, I woud reply, first, that the objection is merely esthetic and is confined to the very few who hav gaind this fine and peculiar literary culture. But the age in which we liv is utilitarian, and wil not allow a merely esthetical objection to stand in the way of a great practical good. The old stage coach was a much more esthetic object than the modern railroad train, but the needs of mankind hav drivn away the coach and welcumd the train. All that is true and valuabl of the filologic or historic allusions found in our words woud survive the change, and the new forms woud soon cum to hav to the generation traind to their use the same power of recalling the storied past.

At any rate, the verdict of the peple, the educated classes especially, is rapidly gathering on the side of the reform. About the centennial year of the Republic the *Home Journal*, the oideist literary paper of New York city, publisht a broadside of short letters from college presidents and profosors, eminent authors and literary men, publicists and statesmen, giving over their own names and in their own words their harty endorsement of the reform proposed. I venture to affirm that to-day, if the census could be taken, the large majority of the profosors in our American colleges woud be found favoring sum reform in the orthograpy of our language.

VI.

W. B. OWEN.

The frase "simplified spelling" limits the discussion to the changes proposed by the philological societies. These changes hav receivd authorization by being introduced as a supplement into the Century Dictionary, and constitute a moderate stage of afmendment as compared with the fonetic ideals of reformers; yet so difficult is it to introduce any variation from the establisht orthografy that it becoms a serious question whether even so small a change as this is feasibl.

I shal discus a singl hindrance, viz., the feeling, amounting to a prejudice, in favor of the forms of words now familiar to the *ey*. We hav many and delicate associations with the *writn* or *printed word*, and any tampering with its form offends us. There ar literary and scolarly associations: it givs a Greek scolar a chil to see *phlegm* speld *flem*. There ar professional associations: a professor of *physics* would feel robd of half his dignity if it wer speld *fysics*; and there ar personal associations of various kinds.

Foren words, too, cling to their nativ habits, and it would seem proper that they should do so up to a certain point. When they hav becum thoroly naturalized they may wel yield to English analogies. Very litl fault is found with *program*, brought into conformity with diagram, epigram, etc.

It wil be useful to attempt a classification of our peple in their relations to this prejudice. There ar, first, those who ar set down in the census as illiterate, amounting to sumthing like seven millions. Then a class not enumerated, perhaps two or three times as many as the illiterates—viz., those who read, but who do so with so much difficulty, spelling and stumbling along, that the accomplishment is a source of very litl plezure or profit to them. Then the foren born, who lern to speak English with no great difficulty, but rarely master the intricacies of English spelling. This class in the eleventh census wil fall litl if any below nine millions. Then, fourthly, scool children, a large majority of whom ar in daily strugl with the spelling book and the reader. Uniting these four classes we hav an aggregate of nearly forty millions to whom any amendment of orthografy that woud make lerning to read easier woud be an unmixt good. My point is that from these classes we should encounter no

prejudice. They must sacrifice nothing, not even feeling. Many of them know just enuf about our spelling to visit upon it, under the impulse of the clear instincts of truth and reason, the hatred it deserves.

A fifth class, from whom no prejudice would be encountered, comprises those who, whether as the promoters of scholarship and the science of language or from motives of economy and philanthropy, favor the reform.

In the remainder of our sixty-odd millions we find the curious results of the habit of much reading.

The art of printing found the English in rather a chaotic condition orthographically, and in course of time the printers gave it uniformity. They fixt it arbitrarily often, according to their convenience or their ignorant notions of what it should be. We read it as they printed it, and think it *must* be so—it *can't* be otherwise. So vivid and permanent ar the impressions of eysight that the printed word becums *the* word to us. We cum to luv even its silent letters and its uncouth combinations, and regard them as necessarily and organically a part of the word. Cut off the *b* from *thumb* and the word is left mangld and bleeding.

A litl serious candid reflection would convince us that the writn word is a ded thing. The *living* word is that which is spoken. Whatever there is that makes a word analogous to an organism is to be found in the connection which exists between the organ of the mind and the organs of speech, of such a nature that states of mind produce movements in the latter. As we ar constituted the organs of speech ar vocal, tho we may eke out meaning with what seem to be instinctiv gestures. The mind seeks to utter itself by vocal movements, not by movement of the muscls that write or the muscls that print. There seems to be a *faculty* of speech, the result of our natural constitution; but writing and printing ar inventions. Language has its natural growth and changes according to certain laws; writing and printing ar mechanical operations, every detail of which may vary arbitrarily. Our attachment to the printed word, therefore, is a matter of association and habit.

I hav brought this matter to a test in my own experience. I onse had a strong preference for the establisht spelling; a reluctance to depart from it; a tendency to associate the fonetic forms of words with illiteracy and ignorance; but that feeling has holely past away. It has been my practice for many years in my own writing and very

largely in my correspondence to spel according to fonetic standards. The result is that I hav broken up the habit of thinking and feeling that *t-h-o* must be written *t-h-o-u-g-h*. *T-h-o* is the word to me, nor do I hav to eke out its meaning by a mental picture of the larger form. Even in homonyms I hav no difficulty. Whether it is *sum* money or a *sum* of money, it is all the same to me (provided it is enuf), and I instinctively spel it s-u-m in either case.

I conclude, therefore, that those who think the printed form is properly *the* word are simply under the influence of a very strange spel.

When it cums to reasons, we are apt to base our preference for the establisht spelling on the claim that it is historical; that it suggests the derivation of words, etc. In many cases, it is true, the silent letters ar the monuments of vanisht sound; but it seems a strange economy to make the word itself, that must pass current in daily and hourly intercourse, the lumber-room of its own worn-out machinery. In a surprizing number of cases, however, the spelling of English words is misleading as to derivation. The *g* in *sovereign* suggests a connection with *reign*; but it is from *superanus*. The *s* in *island* suggests *isle* and the Latin *insula*, with neither of which it has anything to do. The word is properly *iland*, and was so speld in erlier English. The *s* in *isle* also is a comparativly modern interloper; for tho the word is ultimately derived from *insula* it came into English in the form *ile* from the French. The *w* in *whole* conceals the derivation of the word; the *l* in *could* is a blunder; so the *h* in *ghost*, the *g* in *foreign*, the *i* in *parliament*, and in scores and hundreds of words letters hav been introduced in reckless violation of etymology.

Many of our spellings also ar simply pedantic. *Indict* came to us from the French in the form *indite*; but when Latin came to be studied again and it was discoverd that the ultimate derivation was from *indictare*, *c* was inserted as a record of what? Sumbody's erudition! So *victuals* Chaucer spels *vitaille*, directly from the French. Our present spelling would suggest that the word came from Latin *victualia*, which is not true. And what shal we say of such cases as *tongue*? a simpl Anglo-Saxon word, of two syllabls originally, but which lost its ending by fonetic decay and was then increast by the appendage *ue* either in burlesque or servil imitation of the French *langue*. I am inclined to think it was a joke, as the playful paragrafers now put *-ovsky* and *-vitch* after familiar English

words in burlesque of Tolstoi. But think of petrifying a stupid joke like that in the permanent forms of language! Think of compelling a dozen generations of English-speaking children to learn it, and as many generations of writers and printers to write and print it! Then think of brilliant scholars, at the close of this nineteenth century, coming before us to defend the spelling on the ground that it is "picturesque!"

Take now a case where the silent letter is justified by etymology. The *l* in *alms* is historical, but how few there are to whom it is significant of derivation; how few that regard it in any other light than as a conventional flourish. Take your city, with its 250,000 or more people, not 250 of them, not more than 25 of them, write the word and read it with any consciousness of the origin of the *l*. Must 250,000, then, be compelled to learn just where and how to place this *l*, which is never sounded, in order that 25 Greek scholars may have the satisfaction of being reminded of its derivation? Besides, you could think of the derivation if you cared to just as well without the silent letter. In fact, the *l* is a mere fragment of the history of the word. Why not have a more complete and ample record? Go a little further back and we find *almes*; a little further, *almesse*; then *almosen*, *almosna*, *almosina*, *elemosyna*, until we reach the Greek *eleēmosunē* (ἐλεημοσύνη). There would be some advantage in this fuller etymological form. We should at least avoid in print the puzzle of the final *s*, which tends to bring the word into use as a plural, whereas it is singular, as we see from Acts iii: 3, "askt an alms," and in Enoch Arden—

"Enoch set himself,
Scorning an alms, to work whereby to live."

It is obvious enough, however, that words need not carry their whole history about with them and display it at every recurrence on the printed page. The history of words is recorded in literature, and it is the business of dictionaries like the Century and the great one of Dr. Murray to collect this history and exhibit it in convenient form for consultation. It would be a great gain in furnishing materials for the history of language if sounds should cease to be represented to the eye when they cease to be heard. If the *l* in *alms* had ceased to be written when it was no longer pronounced we should be able to mark that point in the history of the word with certainty for which we must now depend on other and less satisfactory evidence.

To return for a moment to the classification of people with reference to the ease with which they read. It is very far from true that the good readers easily learn to spell and learn onse for all. With most of us it is a life-long struggle. We are slaves to the dictionary, and when there is none at hand we turn our phrases so as to avoid the doubtful words. We want to write *deferred*, but are not sure whether there should be one *r* or two, so we say *postponed*. Like the man who sent a written message to his physician, saying, "Come over immediately; we have a very painful case of smallpox at our house." The doctor hurried over in great alarm, examined the patient, and said, greatly relieved, "It's not smallpox; it's rheumatism." "I knew it," answered the man, "but there wasn't a soul in the house who could spell rheumatism."

We tamely submit to the hardships of English spelling under the mistaken impression that our words, if not spelled as they are, would not be English words. Let us hope that as a result of these conferences the learned societies of Washington, and especially the Anthropological Society, may, on the authority of the philologists, make use of amended spelling in their publications, and thus aid in removing the hindrance offered by unreasoning prejudice.

VII.

E. T. PETERS.

The necessity for a simpler orthography has been very strongly presented by those of its advocates who have preceded me in this symposium, and it has been shown, on the other hand, that the objections to a change which have generally been considered most serious are really without substantial foundation. On the one hand we have the assurance of distinguished educators that at least two years of the time now spent in learning to read and write English would be saved by a phonetic system, and on the other hand we have that of the most eminent philologists that if the etymology of words would in some cases be obscured by a phonetic spelling it would in a much larger number be made more plain. In short, the preponderance of pedagogical and philological authority seems to be decidedly in favor of simplified spelling. The ground has already been well covered, but a few additional points may be adduced.

The brilliant essayist and distinguished scholar who opened the debate on the negative called our attention to the fact that by spelling phonetically we should lose a means of distinguishing between words of the same sound which differ in meaning, as in the words *right, rite, write*, etc. That this would occasion no serious difficulty is apparent from the readiness with which we distinguish between the different meanings of the numerous words that are now alike in both sound and spelling. As an instance, take the word *table*, for which fully a dozen distinct meanings are given in our principal dictionaries. When we read of Yorick setting the table in a roar we are in no danger of supposing that the piece of furniture known by that name was the thing so affected, nor should we be at any loss to understand an illiterate correspondent who might ask us to "rite" him in reply to his letter.

The aversion to a change of system is in many cases nothing more than a prejudice against what is unfamiliar. The proposed new spellings no doubt seem uncouth, but this impression is simply the effect of habit and would never arise in the mind of a child accustomed from the start to the phonetic as well as the ordinary forms of words. When Stanley, on nearing the end of his first great journey across Africa, was met and welcomed by some of his Caucasian kindred, the paleness of their complexions, contrasting with the familiar black faces of the natives, at first affected him unpleasantly and he had a momentary impression that perhaps they were not quite well. This feeling was of precisely the same origin as that which causes phonetic spelling like *laf, gard, dum*, and *det* to seem strange and fantastic and impress us with the feeling that there is something seriously amiss with them, while the familiar monstrosities *laugh, guard, dumb*, and *debt* appear correct and natural, if not even graceful in outline. Moreover, the strangeness of the simple, logical, and consistent phonetic forms would pass away with use almost as quickly as that of European complexions passed from the mind of the explorer on the occasion just referred to.

We have been told that language is now more a thing of the eye than of the ear, and that the written or printed word is more essentially the real word than the spoken one. As bearing on this point, there is, I think, much force in the remark of Dr. Owen, that whatever close organic relation there may be between ideas and the words which represent them is a relation between those ideas and

the spoken words, not the written ones ; and unless we are to regard correct pronunciation as a matter of no moment, the fact that a majority even of well-informed people now get their pronunciation from the printed page rather than from the living voice is from a scholar's point of view one of the strongest of all arguments in favor of phonetic spelling. I have heard an ordinarily well-read man pronounce the word *misled* as if it were spelled *m-i-z-z-l-e-d*, and a friend tells me of having heard the same word called *missled* (rhyming with *whistled*). The connection of the word with the verb *mislead* had apparently never been suspected. This entire concealment of its etymology, this complete displacement from the track of its historical descent and cutting off from all its kith and kin, is only one example of what our unphonetic system of word representation may do for those who have to depend mainly upon the eye in acquiring their vocabularies. Even those words which are themselves most nearly phonetic are not secure against the misleading influence of unphonetic analogy so long as our general system of spelling remains what it is.

But the chief argument in favor of simplified spelling is the fact that to tens of millions of children in the English-speaking world it is an absolutely necessary means to the diffusion of that intelligence which in its turn is equally necessary to the success of those popular forms of government on which the English-speaking world preëminently plumes itself.

One of the British inspectors of schools in an official report made a number of years ago used the following language :

"No one will ever read in later life unless reading is quite easy to him, and I believe that no child before attaining the fifth standard can read with the facility necessary to make reading a pleasure to him."

Yet statistics showed that the fifth standard, without whose attainment there was so little hope for the formation of a reading habit in later life, was not attained by more than thirty children out of every one hundred attending school. It thus appears that seventy per cent. of those who were soon to wield the political power of the British islands through their ballots were doomed in advance to lives of ignorance ; and though I have not the statistics at hand, I strongly doubt whether, on the whole, the situation in our own country is any better.

For the mighty work on behalf of human liberty to which we

English-speaking peoples have put our hands, popular intelligence in the widest sense is a condition indispensable to success, and popular intelligence in that widest sense our present system of spelling stops fatally short of making possible.

The place to begin the introduction of a new system is, in my opinion, in the schools. Dr. Harris has shown us that where a phonetic system is first taught and then used as an auxiliary to the learning of our present system the two are learned in much less time than is necessary for the existing system alone without such help. This fact appears to me to present the key to the situation. Those who have lost their two years or more in learning the present system of spelling need not be troubled to learn a new system, unless they are to teach it. It is with the teachers that the new movement should begin, and through the schools that it should be propagated; and its instrument should be a complete phonetic alphabet by whose aid every spoken word can be written or printed so as to represent its correct pronunciation. Our present system must be learned for generations to come by all who aspire to superior scholarship; but for those who have to stop short of its attainment, a phonetic system would furnish a broad and open highway to the realm of knowledge; and when once an approved phonetic alphabet has been made widely known among the children of the schools, it will be a comparatively easy matter for the friends of the movement to arrange for the publication of ample supplies of appropriate reading matter in the new form. Moreover, any adult willing to devote a few hours to the mastery of the phonetic alphabet, printed and script, would learn to read and write the new system with much more facility than he could learn and apply the numerous rules proposed as a means to a partial reform.

VIII.

CHARLES P. G. SCOTT.

"Is simplified spelling feasible?" Are improved roads feasible? Are improved harbors feasible? Can dull axes be sharpened? Can a bent rod be straightened? Can dead leaves be swept away? Can rubbish be removed? Can anything be made better than it is to-day?

Simplified spelling is feasible. Our spelling can be made simple—that is, much less complex than it is now. Then that it ought to be made simple goes without saying.

The announcement of the Anthropological Society says that the subject of simplified spelling will be discussed “from various points of view, including philology, etymology, phonetics, lexicography, pedagogy, literature, telegraphy and stenography, elementary education, linguistics, bibliography, journalism, book-making, and public business.” My opinion is asked, I suppose, because I have worked in sum of these branches of a polite education. I can only say that having spent the days and nights of many years in the study of filology; having made etymology my special pursuit; having wrestled with Jacobean earnestness, if less than Jacobean success, with the mysterious *δαίμων* of fonetics; having spent ten years in the most exacting labors of lexicography, and begun another period of the same form of diversion; having trespassed in a harmless way upon the domains of pedagogy, literature, and most of the other unhappy pursuits mentioned, including several styles of stenography and two styles of journalism (tho I am now completely reformed); having thus chanced to learn sum part of nearly all the things that are involved in spelling or that spelling in any way affects, I can only say that English spelling ought to be simplified, and express the opinion, with a full knowledge of all the theoretical and practical objections that have been or can be brought up, that it *can* be simplified. This, not by the substitution of a minutely elaborate fonetic alphabet constructed anew on scientific lines, but by regulating the use of the present alphabet, by extending the application of existing rules and analogies, by pruning dead limbs, by straightening crooked growths, by correcting the blunders forced into our orthography by the intellectual progenitors of those who now oppose the removal of these blunders and anomalies under the delusion that they are thereby defending etymology, whereof they know nothing, and literature, whereof they know only the dangerous little.

English spelling can be simplified; but it cannot be simplified by “time,” or by “the spirit of progress,” or by “a gradual advance in culture,” or by “general agreement,” or by any other abstraction whatsoever. There will never be the slightest change in spelling effected by these ghosts of the mind. Spelling is the drawing, pressing, or cutting of significant lines on paper or other material by human fingers, or by machinery ultimately moved by human fingers.

It follows that only human beings can change spelling. There are 66,000,000 human beings in the United States. Many of them are highly intelligent. It is they who ought to begin improvements. It is they alone who can effect improvements in spelling. They will not begin all at once. Some have begun already. Others will begin later. There are many intelligent human beings in Washington. Why should not these intelligent human beings stop waiting on "time," and begin to improve English spelling themselves?

It is idle to postpone all action until all spelling reformers "agree." It is not thus that reforms are effected. It is the law of human progress that one or a few shall propose; that the many shall assent in general; that the few shall then work out the details in part; that all shall then move on, and that in the end the final form of the thing proposed shall emerge—never as proposed, but often better. Then there is a new idea, a new agitation, another end, and a new form. So let it be with spelling.

Those who are in a position to influence the spelling of dictionaries now in preparation would be glad to be able to record as actual usage the simpler spellings proposed by the advocates of reform. Every scientific society can help to make actual usage, namely, by actual use. The philological societies are scientific, and they have begun. The Anthropological Society is scientific—let it continue. And let all societies concerned with man and his improvement help not only to improve his ideas, but also to improve his way of putting them on paper.

IX.

JAMES C. PILLING.

So much has already been said *pro* and *con*. upon the general subject under consideration that there is little for me to add, unless it be a few words upon one point on which sufficient stress has not been laid. I allude to the length of time consumed in learning to read and write by the aid of Roman characters as used by us as compared with other methods in use by other peoples.

Dr. Harris, in speaking of the experiments conducted under his direction in the public schools of St. Louis, stated that children spend

in lerning to read fluently two and one-half years. Think of it, two and one-half years! Better results hav been obtained by other methods. Let me mention sum of them.

About 1820 a half-breed Cherokee Indian named Sequoyah, better known by his English name, George Guess, the son of a Duch pedlar and Cherokee mother, an illiterate vagabond, vague and dreamy, if report be true, who coud read neither his own nor any other language, was taunted, it is said, with this fact by sum white men; whereupon, so the story goes, he retorted that he would lern and teach his brethren as wel.

Knowing nothing of ancient methods, he had to think out his own plan, which naturally was a fonetic one. He first sought to evolv from his mind all the sounds contained in the Cherokee language, and succeeded in differentiating eighty-two. The next step was to represent them by writn signs.

But two books had been printed in the Cherokee, both litl primers in Roman characters, which had, I believ, English values. No Cherokee books in these characters hav been printed sinse.

Borrowing one of these primers from the missionary station for the sake of such suggestions as it might afford, he proceeded to trace such outlines as seemd to him to suit the case, and the result is the present Cherokee syllabary, with the exception that four characters hav sinse been added to represent sounds not listed by Guess.

This syllabary is one of the most curious compounds imaginabl—wurse, perhaps, than would be expected to come from even such a sourse. Based, as I hav said, upon the Roman characters found in the spelling book, he took all sorts of liberties with them, subjected them to all kinds of indignities, turnd them upside down, wrong side to, added tails where fancy dictated, and sumtimes even horns. They ar hard to make, cannot be joind together as in our script, and altogether constitute as varied a hodge-podge as even the untutord mind coud desire. As characters they possess but one redeeming trait—onse memorized, it woud scarcely be possibl to forget them.

Bad as this “alfabet” is from a mechanical standpoint, it is even wurse when viewd from the fonetic side, for he violated every one of the primary rules of fonetic writing. The sounds evolvd wer not, with one or two exceptions, simpl sounds, but compound—hat is, a consonant followd by a vowel sound, e. g., *ba*, *be*, *bi*, *bo*, *bu*, etc.—not an alfabet but a syllabary. Simpl sounds ar not repre-

sented by simpl signs, nor compound sounds by compound signs, nor are similar sounds indicated by similar signs, all of which the laws of fonetic writing demand ; but he carried out the one cardinal principl of fonetic writing, the same character for the same sound, and therein his victory lies.

It was not long before the Guess syllabary came to the notice of the missionaries, who became convinced of its utility, and various manuscripts were prepared for instruction in the schools. The feasibility of the scheme being proved, application was made to the officers of the American Board of Commissioners for Foreign Missions at Boston for a font of type from which to print in these characters. This request was granted, based perhaps on the statement of Mr. Worcester, one of their erliest and best missionaries, that "a few hours of instruction are sufficient for a Cherokee to learn to read his own language intelligibly ;" and, again, "if a book were printed in that character there are those in every part of the nation who could read it at once, and many others would only have to obtain a few hours of instruction from some friend to enable them to do so. They have but to learn their alphabet and they can read at once. Probably at least twenty, perhaps fifty, times as many would read a book printed in Guess's characters as would read one printed with the English alphabet."

The erliest print I hav seen of the Cherokee syllabary is in a Government document, a letter from the Secretary of War to the Commissioner of Indian Affairs, dated February 21, 1826, and the first actual printing in it in the *Missionary Herald*, publisht in Boston, in 1828, which contained the first five verses of Genesis. From this time until now the literature of the Cherokee peple has been printed in these characters. In 1829 the *Cherokee Phoenix*, a weekly periodical, was started. Their constitution, laws, and treaties, the Scriptures, scool books, almanacs, prayer books, hymn books, and many other kinds of books ar printed in them.

Now, how long does it require the Cherokee child to acquire the art of reading and writing fluently in these rude characters ? If the testimony of its teachers, reiterated over and over again, be wurth anything, not two and one-half years, but two and one-half months.

About 1840 James Evans, a Methodist clergyman who had been a missionary among the Chippewa Indians, and for whom he had composed a book in their language, printed in Roman characters with English values, was induced to go as missionary and teacher

among the Crees. His experience among the Chippewa, the amount of labor required to teach them to read with our characters, had been a lesson of which he was quick to avail himself, and caused him to invent what is known as the Cree syllabary—a great improvement on the Cherokee. His characters, nine in number, are simple and easily made, and are capable of being turned four different ways to make the thirty-six consonant sounds; to these are added points and dots for the vowels. He cut his models in wood himself, and from the lead linings of the tea-chests begged from the officers of the Hudson Bay Company's posts he cast a font of type. With his own hands he constructed a rude printing press, and with ink made from soot began the printing of leaflets, hymns, prayers, and what-not for his Indian charges. Later the British and Foreign Bible Society cast a font of type for him, and to-day there is a vast literature printed in these characters, not only in the Cree language, but in many others. Those who use them in teaching say it takes the average child not two and one-half years to learn to read fluently, but a few weeks.

Do not understand me to say this is a perfect fonetic alphabet, or syllabary even; but it was and is sufficient for their purpose, and to-day, as when invented, each character has its own individual value and no other.

In 1889 this syllabary was much improved by Father Morice, a French priest, stationed at Stuart's Lake, British Columbia, and with it it is possible to represent the minute sounds of human speech.

Within a year or two another French priest, Father Le Jeune, also of British Columbia, has successfully introduced short-hand characters among his people, and his claim is that a few weeks only are necessary for the natives to learn to read fluently.

Of all the serial publications I have ever seen or heard of, one issued by Father Le Jeune is the queerest. It is in an international jargon made up of half a dozen languages and known as the Chinook jargon. The writing is done with a pen, and the impressions are made by aid of the mimeograph on brown and blue and white and yellow paper. Each week his periodical appears, however, and much of his work is done while traveling over the five thousand square miles of his missionary territory with his pack on his back, or on a dog sled.

All that I have said as to the saving of time by fonetic or semi-fonetic methods refers to peoples who had little to unlearn. Its bearing

upon simplified spelling as applied to the English language I leave for you to judge.

My own experience with fonetic writing covers a period of more than twenty years, first as a stenografer, later as an editor and writer, and finally as a bibliografer, and during the erlier part of that time I succeeded in making record by fonetic methods of several languages other than my own—among them, a number of our native Indian languages. I mention this merely as a proof of the feasibility of recording human speech by fonetic methods, or, if the frase better suits, by simplified spelling.

X.

BENJAMIN E. SMITH.

The problem of the simplification of our spelling, though of great interest, has not, in the present condition of the reform, much *practical* significance for the maker of dictionaries. Public opinion has made him understand that, whatever he may believe, it is his duty to disregard his own views and confine himself to the simple recording of usage. The best lexicography is, by common consent, that which keeps closest to the facts—acceptable or not—of the spoken and written language and reports them most completely. It is established that in most directions, and most emphatically in the orthography and pronunciation of the common words of the language, the lexicographer has no scientific freedom;* that for him whatever is must be right simply because it exists; or, more exactly, that he is to be a mere historian of words, writing for the most part like the annalist who sets down without comment whatever happens just as it occurs. Whether this restriction is in accord with reason or is merely a conventional rule, it must be accepted by every dictionary which aspires to have its authority as a guide recognized. A notable illustration of this fact is the dictionary of the Philological Society, in which, if anywhere, practical reform on scientific lines might be commended and exemplified, but which, if I mistake not, has placed itself in a conservative position.

* This, of course, does not apply to technical and rare words.

But there is another reason why it would be idle for the promoters of spelling-reform to expect from the large English dictionaries, now existing or yet to be made, radical action toward establishing a new orthography. The making of these books is not an entirely disinterested scientific labor, but is, and apparently must be, fundamentally a business enterprise. The expenditure of time and money involved in collecting and properly editing the immense and many-sided material required of the modern dictionary is so vast that private scholarship cannot assume it, while on the other hand the chance of commercial profit upon even a very costly work of this kind which succeeds in gaining popular favor is so great, that it appears to be always possible to find publishers who are willing to take the chance of success along popular lines. But in a business enterprise the first thing is "business;" and it would be very poor "business" for a publisher to attempt to initiate a reform which not only is (apparently) distasteful to the public at large, but has also to meet much special opposition, particularly in those strongholds of the dictionary, the school and the printing-office. The only escape from this situation is for philologists and other scientific men to contribute freely enough labor, and some association or patron of learning enough money, to make the business question a matter of total indifference, and so the dictionary governed throughout by strictly scientific considerations a possibility.

The makers of dictionaries are not, then, under the existing conditions, to be looked to in their editorial capacity as leaders of the reform. But if they cannot *lead*, will they *follow* if the conditions become more favorable? This is a question of some importance, for if the reform ever gets well in motion a time must come when they can either greatly further it or hinder it, according to the policy they adopt—the time, namely, when a reformed orthography will really exist back of which there is genuine usage. The restrictions which prevent the lexicographer from taking the initiative will then in large measure be removed. By it can be shown by the extent of its acceptance that the reform is actually on its feet, the business men, in whose hands are the issues of lexicography, will look upon it with a more friendly eye: it will also then be the manifest duty of the dictionary editor, as the historian of the language, at least to recognize the simplified spellings as facts. He may even find that he will be supported in going further and making some definite advance in the new direction, such as giving the new forms

an alternative position in his vocabulary as a step preliminary to giving them the first place. If, in that case, he is willing to give the reform hearty support, its success may safely be said to be certain. If, on the other hand, his present conservative position is persisted in, it is hard to see how much further progress can be made; for while it is quite possible to bring a new system of spelling into extensive use in journals and other publications of influential character, such usage must remain essentially artificial and so in a constant struggle for existence, unless it is in due time supported by a great army of readers and writers who have learned it in the schools. Into the schools, however, it can get only through the dictionaries and the spelling-books based upon them.

Will the dictionary-makers, then, if the opportunity to further the reform is offered them in this way, embrace it or reject it?

The answer to this question depends upon two things—their personal attitude toward spelling-reform of any kind, and the kind of reform that is offered them. On the first point little need be said. It may safely be assumed that there are few editors of our great dictionaries who are not by conviction and at heart spelling-reformers. Certainly my own experience upon the staff to which I have the honor to belong, and which includes the names of Prof. William D. Whitney, Dr. Charles P. G. Scott, and Prof. Thomas R. Lounsbury, leads me to think that in this matter the check will be more needed than the spur. In “The Century Dictionary” is expressed repeatedly and in no uncertain way the desire to promote what its editors believe to be the cause both of reason and of practical sense. Of the other dictionaries, “Webster,” if it is true to its traditions, must be in sympathy with us; “Worcester,” now that its editorship has been placed in the hands of Dr. Scott, will hardly wish to hold aloof; while from the new dictionary, not yet born, coöperation may be expected, since it bears upon its list of editors the name of Prof. Francis A. March. It is indeed inconceivable that any one who has studied the matter from the inside of a dictionary office should retain a shred of superstitious reverence or even of decent regard for the existing orthography. If it is a fetish anywhere, outside of the study of the London correspondent of the *New York Tribune*, the place is not the workshop where the dictionary is made.

With regard to the second point two things are, I think, especially to be noted: First, that while the dictionaries do not require that

the stability of individual simplified forms which they may be willing to adopt shall be guaranteed, they are not likely to be able to accept a *system* which is probably transitory, certainly not one which is professedly transitional. In explanation of this I may be pardoned for again citing the example of "The Century Dictionary." There is even in the existing state of our orthography a considerable number of cases where two or more spellings exist all sanctioned by recognized usage, but one of which is notably simpler than the others. In such cases the lexicographer has the power of choosing either the more complex or the simpler form, and it is well known that the latter course was systematically adopted by Prof. Whitney in the interest of spelling-reform. At the same time it was not assumed that these simplifications are all of them the best that could be thought of or that some of them may not, perhaps, in a brief time actually be supplanted by better: the reason for adopting them was simply that they were the best then existing under conditions which rendered their adoption possible; and the same process may be carried on still more extensively in the future, if in the meantime other simplifications, whatever they may be, receive the imprimatur of public opinion. But a *systematic* simplification is a very different thing. It must, even under the most favorable conditions which the cleverets and most persistent effort can produce, force many things down the public throat which will leave a decidedly bitter taste; and if to this is added the statement that another and perhaps worse bolus must be swallowed in the near future, the people, and with them the "business interests" I have mentioned, will doubtless refuse to take the prescription at all. If any system is adopted it should be one which will produce spellings which as a whole can be regarded as practically final: there should be no suggestions of extensive changes to come. It may be wise, even if such a system is adopted, to attempt at first to press the use of only a limited number of applications of it—those, namely, which most nearly resemble forms already in use and are most likely to be regarded with favor. If this is done I am confident that dictionary-makers will feel that they will have a better chance to lend a helping hand.

In the second place, I believe that the dictionaries will, in any case, be able to aid in promoting the adoption only of a system which makes as little change as possible in the existing orthography. To the philologist nothing may seem worth considering as the ultimate goal but an ideal method based upon a scientific notation.

But to the non-philologist, who in this country at least is probably going to settle the matter, the charms of such an ideal will not appeal with much force: he cannot see why a simple tool which serves his ends well, though in a somewhat rough-and-ready way, and with the action of which he is in the main familiar, is not better than a complicated engine, many of whose parts are strange to him and which he does not know how to work. That the one is unscientific while the other is scientific will not affect him a particle. For my part, I think he is right: but, right or wrong, the dictionary-maker must take sides with him, since it is for him that dictionaries are made.

XI.

W. D. WHITNEY.

In the first place, the form in which the question of debate has been put, "Is simplified spelling feasible?" appears to me to have been well chosen. The form "Is simplified spelling desirable?" would have been behind the times, and worthy rather of a village debating society than of a scientific association in a great city. The desirability of a reform of our orthography is already established by those who are best qualified to speak as to what is demanded by the dignity and value of the English language and the interests of the study of languages and of language. The arguments brought up in opposition are nothing better than subterfuges under which the inertia of habit seeks to hide itself; they are always weak to if not over the verge of silliness. A man is a respectable antagonist if he comes out frankly and says "I like the old system because I am familiar with it, and the change to any other would be troublesome to me, and at least at first offensive to my eye;" but if, while really meaning only this, he asserts that the English language would be harmed and shamed by a better-fitting dress, he cannot complain that he is answered only by derisive smiles. If the Rev. Jasper had preached his parody ("the sun do move") of Galileo's famous mumbled protest (*eppur' si muove*) in Galileo's time, he would have had the lazers on his side, even among the learned. At present they are all against him, except in his own congregation.

One of the conditions of success of the orthographical reform is the eradication of the strange notion that the language which is uttered and heard is affected either one way or the other by an alteration of its mode of representation to the eye. Have the shorthand writers done any damage to our speech by all their outlandish systems? We might force it even into a Chinese dress without in the least changing its substance; only its readers and writers would suffer, as, indeed, they unconsciously suffer now. A change of orthography is a matter only of practical convenience, as purely external as a change of personal wearing apparel. So long as men continue to worship old fashions in spelling because of their oldness, they will fight against any and every innovation, however well supported. Whence comes the perversity that makes nearly all British writers cling to the absurd spelling *g-a-o-l* for *jail*? Mr. Andrew Lang has lately (I am unable at the moment to refer to the place) pleaded that the virulent British opposition to what they call American spellings is nothing more than the expression of a preference on their part; they like their own way better, just as we like ours, and each has an equal right to do so. But that is a very imperfect statement of the case; for, even apart from the fact that, as between the favorers of *gaol* and those of *jail*, the better right to disapprove of the other party evidently belongs to the latter, it is the intensity of British disapprobation, amounting even to abhorrence, that we justly complain of. Till the British learn to view our improvements with a truly tolerant eye we have the right to reproach them for their short-sighted prejudice. Professor Mahaffy is to be thanked for his one piece of independence in spelling *sovereign* with *s-o-v-e-r-a-i-n*, as is every other man who contributes a mite toward breaking down the senseless belief that a mode of spelling is something sacred.

The final success of the reform movement will depend upon the power of altruism in the English-speaking race. No doubt it is far easier for us, who have thoroughly learned the old system, to go quietly on using it, especially if the opposite course is to involve for us the bother of societies, public discussions, symposiums, and the like; but we heartily believe that the said old system is to be a heavy burden upon all who shall hereafter come to acquire it; that it costs (and this is to my mind the crowning consideration) untold labor and time to every child that learns to read and write, besides pursuing with undeserved shame the unfortunates who (small blame to them) never do nor can succeed in mastering it; and, further, that

it operates like a sixty per cent. tariff to the disadvantage of the forener; and tho it has been claimd in this discussion, in tru McKinleyan spirit, that foreners hav no claim to our consideration, because nothing about our speech was framed for their benefit, I think that, in their sweeping disregard of both justice and mercy in matters orthografical, our ancestors were holely impartial, and cared just as litl for us their descendants as for the rest of the world; and it would be to our credit to act in a different manner. No smal part of the work of the spelling reformers for sum time to cum must lie in the line of convincing the community at large that there is really involvd in the reform this antagonism between selfish inertia and altruistic effort. When the truth is more generally and clearly seen, there wil at least be a better prospect of succes for the altruistic movement. The very kernel of the question of feasibility, of course, lies just here: Wil the community ever be generous enuf in any generation to endure the inevitabl trials implied in a change of spelling, for the acknowledgd benefit of all the innumerabl other generations who shal afterward lern to read and write English? Perhaps he would be a bold man who should confidently answer "yes." Certainly he would deserve to be called a dastard who should say "no." The end, at any rate, is worthy to be workt for with zeal and hope and patience.

The motive to reform is not merely sentimental—tho that too ought to count for sumthing, truth and consistency being good things in spelling also, as elsewhere; it is, abuv all, practical. A reformd spelling has the grace of fitness, but yet more the virtue of utility.

A simplified spelling would of course be, so far forth, a fonetic spelling; but I do not see that we need to strive after a scientifically accurate representation of the utterance of any clas or locality or individual. No existing alfabet does that; none that has ever existed has done it. Alexander J. Ellis, than whom no man has done better and more enlightend service to our cause, has said (in his "Dimidian Spelling") that if we coud arrive, as the result of our efforts, at as consistent and accurate an orthografy as is the recent Netherlandish or Spanish, we might wel be content; and I am inclined to agree with him. If, for example, we can get the *gh* of *laugh* turned into an *f*, and the two vowels reduced to one, the degree of varying flatness or openness with which the vowel shal be pronounced may wel be overlookt in an orthografy intended for an

immense community like that of the speakers of English, and therefore, by the laws of linguistic growth, necessarily including a certain percentage of varying pronunciation. Practical convenience will sufficiently control the degree of exactness aimed at and attained.

XII.

J. W. POWELL.

When the question of reform in the spelling of English words was first introduced, a good many curious arguments were brought up against it. It was claimed that it would obscure the record of the ancient words from which the present words are derived—that there is much history and etymology in the present spelling of the words, which would thus be destroyed. That argument was used with great vigor for a long time, until at last philologists determined to make a careful examination of the subject. This has been done, and it has shown that the present spelling of the words of the English language obscures many more etymologies than it reveals.

Another curious argument brought up against reform in English spelling is that there is a content of meaning in the spelling of the words, that they derive their meaning from their letters; and perhaps no more rhetorical argument was ever made for the old spelling than is made on that basis—that the letter of the word is the sign of an idea, that if you change the spelling you lose some of the meaning. The fact is, the letters are the signs of the *spoken* word, so that in a printed word we have a symbol for a symbol. We may spell a word b-o or b-e-a-u; if we were accustomed to spelling it b-o, it would have the same meaning as when spelled b-e-a-u. There is no advantage in the more elaborate spelling. Suppose I say "John Anderson my Jo John" and spell it J-e-a-u; it would mean no more than Jo. The sematic content of a word depends not upon its spelling.

The real difficulty to-day in the way of reformed spelling is this: The libraries of the world, large and small, in the English language are in a particular form, and they would become of less use if the spelling were changed. The books now on hand would not become useless to scholars; but the common people also buy books. The

large body of books would become more or less obsolete by changing the spelling, and very many old books would have to be republished. That is to be weighed. The advantage to the people of changing the spelling should be summed up with very great care. Supposing that in our common schools it requires a given number of years for the average scholar to gain a certain amount of knowledge—the average shortening of the time required to gain that knowledge would be very considerable; teachers say it would shorten the time two years. If we could reform our spelling, therefore, and still give the youth of the land the same time in the schools as now, it would afford them from one and a half to two years of additional time to go on and take up other branches of study. The time has arrived when this is of very great importance. We are now giving to the primary schools and to the grammar schools about eight years, then to the secondary or high school education three or four years more. If we could reform the system it would have this effect: it would add two years to the accomplishment without adding to the time spent.

Then consider the study of spelling itself as a branch of education. If the spelling were reformed there would be no more going to school to learn to spell, for we would learn to spell as we learn to speak, by the same effort. There would be no learning to spell as a distinct study. In devoting time to learning to spell, we are devoting time to a purely artificial accomplishment—no real accomplishment—and to the study of something utterly illogical and devoid of common sense—to something which, instead of the very thing that people need, is a study of no value whatever. Reformed spelling would give to the youth of the land two years of blessed life; for of all the drudgeries and all the studies devised or ever introduced into our public schools to train children in stupidity, the learning to spell the words of the English language is the surest—this foolish spelling, to which one and a half or two years of the life of all the boys and girls of our land is devoted. Surely we can afford to reprint the libraries in the English language to gain so great an advantage.

All that I have said is a plea for the radical and thorough reform of the spelling of the English language; but there is a compromise method which is proposed by the Philological Association and other scientific bodies of this country, and the one generally advocated, and this is the proposition which is before you, to reform the spell-

ing only in part. By so doing it is found that the time necessary for learning to spell will be greatly shortened, and that these changes can be made in such a manner that the books now printed will not become obsolete ; that any person using the reformed spelling can without serious difficulty read the old spelling. Under this plan, then, it is not proposed to make such changes as would render the printed matter now on hand less accessible to the people ; to retain such of the abnormal spellings as would prevent this, and to retain such abnormal spellings as would make useful distinctions between words of different meaning having the same sound, and to retain such spellings as would give any reasonable clue to the etymological history of the word. This seems to me to be a fair compromise, and under all the circumstances to be the wisest thing that can be done. The advantage would be very great ; the saving of time would be important, and the spellings would reveal far more etymology than is now revealed by them. It is for this reason that I am in favor of the change recommended by the Philological Association.

FINAL REMARKS.

A. R. SPOFFORD.

I can do no more than to gather up a few threads from this discursive debate, by answering some suggestions which have been made from the other side.

My learned and candid friend, the author of the "World-English" alphabet, was pleased to say that spelling reform must be established by official means or not at all. And another speaker referred with praise to the German tongue as an almost phonetic language, and one which had been made still more so by the aid of the government. Now, whatever may be thought of the paternalism exhibited by that monarchy in interfering with methods of writing and speaking within its dominions, no similar action on the part of our republican government is either desirable or possible. The general government is one of strictly defined and limited powers. With the direct education of the people, as with their literature or their religion, Congress has nothing whatever to do. Yet that body has

heretofore been asked, without a shadow of reason, to institute one special method of spelling certain words, and to do this by authority, in all the printing of the government. It would be a most unwise proceeding for Congress to enter into the domain of opinion, and undertake to promote a controverted reform in our methods of writing and printing. If so loose a construction of the powers of that body were to prevail, what guarantee is there that we should not next witness its intervention in the private education of the people, prescribing what books shall be used, and what opinions shall be propagated? From recommending in what way we shall write or print our language, to prescribing what we shall study or what we shall believe, is but a single step. The true function of our government is best accomplished by leaving all reforms (including reforms of language) to the free operation of natural causes, while all schools of opinion receive the equal protection of the laws. Far distant be the day when Americans shall be drilled or instructed after the fashion of the German Empire, whether in functions military or civil. Let us guard our free government against the insidious inroads of a paternal system, or from falling into the hands of propagandists of opinion; guard it, for when it thus falls, there will fall with it, in one common grave, the constitution of the government and the liberties of the people.

Again, my learned friend says that the spelling reform should begin by omitting all phonetically dispensable letters; but this is by no means what the vocabulary adopted as a beginning by the Philological societies, and now before us, proposes. On the contrary, it retains multitudes of phonetically dispensable letters in its select list of "amended spellings," while it retains hundreds of thousands more of superfluous letters in words with which it does not undertake to meddle. A learned society which makes it its chief argument to charge existing spellings with intolerable inconsistency should at least show some respect for its own consistency before asking us to pin our faith to its conclusions. Thus, it declines to amend *casque* into *cask*, because "a valuable distinction between two words is lost," but it reforms *whole* into *hole*, though the same confusion of words is created. It keeps the superfluous final *e* in *edge* and *wedge*, while eliding it from hundreds of words where it as properly belongs. It refuses to spell *dun* for *done*, *munth* for *month*, because "the derivation is obscured;" but it has no compunction in destroying the derivation in such a word as *courage*, which it

actually has the courage to spell *curage*, and *money*, *muny*; though the origin of the word as well as its meaning is in each case obscured. It refuses to reform the useless initial *k* in *know* and *knowledge*, though the Latin form *noscere* would justify it; but it has the fatuity to spell *culor* and *cumpany*, thus effectually concealing the origin of both. It cuts out the initial *s* from *scissors* and *scimitar*, but leaves it untouched in *science*. How can it reconcile the spelling of *knowledge* with nine letters, when five letters will spell it phonetically—thus, *noleg*? The Philological Association has not even the consistency to spell its own name after its own rules, but prints all its transactions with the *ph* instead of the phonetic *f*. Not to multiply examples, it is pertinent to ask the spelling reformer, Why not cast out first the beam from his own eye, and then he may see clearly to cast out the mote from our eyes? There has been only one phonologist in this discussion who admitted that he writes after the orthography (or cacography) of the system so earnestly recommended to others. There is nothing at once more touching and more significant as an argument than this general reluctance of spelling reformers to take their own medicine. Knowing full well (for they are men of science) into what a jumble of inconsistencies the adoption of this “list of amended spellings” would plunge them, they prudently decline to take the leap.

A reform so profoundly illogical, so utterly at war with its own avowed principles, has probably never been proposed to men of letters. It destroys (so far as it dares to venture, but no farther) what orthographic rules we now have, without giving us any new ones by which it is willing to stand. It “reforms” a certain vocabulary of words by disfiguring them almost beyond recognition, and refuses to reform others which stand in far greater need of amendment. One portion of the same word is reformed, while the rest of it is left anomalous. No principle nor method can be found in this hybrid collection of specimens. Follow it as far as it goes, and you would introduce utter chaos into spelling and writing. Follow it out in all its analogies, and apply the rules of phonetics with impartial hand, and you would arrive at a reconstruction of the language far more startling, but immeasurably more logical.

When the spelling reformers submit to the people a reform worthy of the name, they may more confidently count upon a hearing. Why put before us a phonetic scheme which gives us reform with one hand, and takes it away with the other? This skirmishing about

the outskirts of their reform, this sailing-around point no point is unworthy of the high contest of principle in which they profess to have engaged. When they bring on their reserves, the battle of the languages may begin in earnest, but not till then.

We have been pointed again and again to the obstacles which English spelling throws in the path of foreigners, and I am charged with exclusive and narrow views in refusing to simplify spelling to aid foreign acquisition of our language. To this there are two answers: 1st, the simplified spelling now proposed removes extremely few obstacles, while it introduces many new anomalies and confusions; and, 2d, on a question of broad or narrow views, I prefer to consider the English-speaking race as first entitled to regard concerning the expression of their own language.

We are told that there are six million illiterates in the United States (a fact which we all deplore), and that we need reformed spelling that they may learn to read. But do we not know that most of this ignorance has nothing to do with the difficulties of orthography, but comes from other causes? It is due in great part to the absence or non-enforcement of compulsory education; to the curse of poverty, keeping children from school to work, or beg, or steal; to the indifference or neglect of many teachers of spelling; and to that mental dullness in multitudes of cases which no helps of any phonetic system could overcome. We are about to admit to the Union a State in which the appalling number of two-thirds of the population over ten years cannot read, although their native language is almost a phonetic one, in which words are spelled as they are spoken. Other conditions than these control the acquisition of the art of reading. Besides, the foreigner of native intelligence who knows his own language masters our tongue in a period sufficiently brief—in direct proportion to that intelligence. Even the formidable *ough*, that famous *pons asinorum* of the phonologists, has been known to yield to a few hours' vigorous assault by foreigners of average sense and skill. When you point us to the woes of foreigners struggling with our abominable language, we point you to the seven millions of foreign-born citizens of this Republic who are happy to have mastered it. Why take for granted an ignorance which does not exist, and parade before the eyes of foreigners bugbears which never trouble their sleep? The fact is, you can't keep foreigners from learning English; they have been

for generations taking this country by storm, and its language along with it.

The very fact cited here, of the prodigious spread of the English tongue in the last century—from twenty-two millions to one hundred and ten millions who now use it—is proof enough of its vitality, its excellence, and its adaptation to the wants of mankind.

The German language has been eulogized for its phonetic simplicity in sounding every letter in every word. But who would adopt the German as a universal language, with its guttural sounds, its involuted and convoluted sentences, and its endlessly compounded words? Is there any living man who would propose to substitute the German for the French, which has been for generations the language of diplomacy? Yet the French tongue abounds in silent letters and unpronounced terminals, and in not being spelled as it is spoken, it is second only to the English. Why have there been no efforts to reform the French language into a phonetic one, by its many learned societies? Because the French are a practical race, content to let well enough alone, and not to turn their language upside down in pursuit of petty orthographic economies.

But we are confronted by every phonologist with the great army of school children, who must take such an intolerable amount of time and pains in learning how to spell. "The children's argument," we are told, "is the best argument for the spelling reform." I grant that this is the proper place—I had almost said the only place—to start an innovation so radical as this. Simplified spelling, if it comes at all, will not be brought about by resolutions of philologists, nor by vocabularies of amended spellings relegated to the rear of dictionaries, nor by appeals to authors to write after the new method, nor by striving to move publishers to print books phonetically, nor by act of Congress or legislatures commanding public laws and documents to be spelled with the fewest letters. Let me say to my phonetic friends, that when they come to us to adopt their system they are beginning at the wrong end. We cannot help their cause much if we would, and some of us would not, even if we could. It is sheer waste of breath for them to try to persuade grown up doctors or lawyers or clergymen to spell "*physic*" and "*physician*" with an *f*. They must indispensably begin their cure lower down. If they expect to teach this system of spelling to any considerable number of disciples, then the disciples must be caught young. Whatever they may choose to think about it, it will ultimately be

found that the school teacher will be the only captain of their salvation.

And even in the primary school, there are reasons for believing that this reform is not so pressingly needed as has been claimed. When we are told that phonetics will save 50 per cent. of the time consumed in learning to read, we simply challenge the proof. It is not enough to point to certain classes in certain schools in St. Louis in evidence. St. Louis is not the United States; and we can bring isolated cases as numerous as theirs to prove that children from five to eight years of age, and of average capacity, have learned to read well in from ten weeks to six months by the existing method. The phonologists insist constantly on the supreme importance of spelling by sound, as if the ear were the chief organ in learning to read. They carefully ignore the eye—the really important organ—which takes in the picture of the word, and prints it more or less indelibly in the mind. In reading, it is the intellectual sense that is impressed, not the mere physical vocal organs. A written language implies an expression of thought. The eye recognizes words by their looks and their meaning, as well as by their spelling or their sound. The word-picture on the retina of the child's eye and that on the retina of the mind (if I may use the expression) are synchronous and all-important; and of these keen-eyed little souls who learn to read by word-pictures, your schools are all full. Phonologists magnify the act of pronunciation, as if that were the final end in learning to read, whereas children have already learned to pronounce a large vocabulary of their language, long before they begin to learn to read it at all. It seems like putting the cart before the horse to insist upon the supreme value of spelling by sound, when we all know that we can and do learn to read and understand foreign languages—spelling and all—without knowing how to pronounce a word of them. The word-pictures, the analogous forms, the gradually enlarging vocabulary, the instinct or intuition of language, do it all, without the lips uttering a sound. Different children will, of course, have different facilities for seizing and remembering these word-pictures. But we all know it for a fact of experience that we remember and identify words chiefly by the image presented to the mind through the eye, not by association with their sounds through the ear; and this, together with the fact that the great majority of our words are in reality now spelled as they are pronounced, speaks volumes in favor of letting the language alone: at least until some

better contrivance for its amendment than this lame and hybrid and inconsistent "reform" is proposed to us.

Yet the sorrows of childhood over the English alphabet form the chief burden of our phonetic advocates. "*Omnes redundant ex eo fonte dolores.*" But who ever heard of the school boys and girls of earlier generations thinking themselves unequal to the task of learning the English language, with all its complexities? Is the human race degenerating? Were our fathers and ourselves endowed with brighter intellects than the children of to-day? Is it come to this—that with all our varied accomplishments, our march of progress, and our *fin de siècle* learning, we must make a pitiful appeal for "simplified spelling" to help out our simple sons and daughters who can't get their lessons to save their lives? Never believe it. Our boys and girls of twelve to fourteen can learn Latin and Greek and French and German, but it is alleged to be an awful task for anybody to learn English! Let us have a commission appointed to find out what has become of all our boasted public intelligence.

The phonologists make light of the etymological argument, and assert that the present spelling conceals derivations far more frequently than it reveals them. Some declare that for every word in which etymology is shown by present orthography, there are two in which it is obscured. Such unsupported statements are as worthless as all similar generalizations or assumptions upon matters where exact knowledge alone is of any value. The dealing of the philological societies with the partial vocabulary put forth as "amended spellings" is not adapted to inspire the utmost confidence in their conclusions as to the totality of our vast and copious language.

If the representatives of spelling reform would agree to refrain from meddling with words in which phonetic spelling suppresses or conceals derivation, their opponents might yield the point of reforming phonetically words whose origin is really obscured by the present orthography—if spelling them by sound would really restore it. Here is a field in which their labors might be far more usefully employed.

But now comes my suave and learned friend, who believes that the good time is at hand when we shall all get used to spelling short, and wonder why we never did it before. He tells us, with a confidence born of perfect faith in his cause, that a large majority of the literary men of England and America are in favor of spelling reform. Some of us would rather wait till the returns are in, before taking

this statement upon trust. Also, we are told of the great names whom the reform counts among its supporters: Max Müller, and Whitney, and March, and Ellis, and others, "Men at whose feet we must sit as learners." If we are to settle questions of this magnitude by the majority of voices among philologists, perhaps it is settled, though there are many people who believe that nothing is ever settled till it is settled right. Meanwhile I venture modestly to put Dean Trench, and President Eliot, of Harvard, and Richard Grant White, and Oliver Wendell Holmes on the other side of the authorities quoted—though the question is not one to be settled by authority, but by reason and experience.

We are told that on this subject any appeal to the æsthetic sense is out of place; that we are a practical nation, living in a utilitarian age, and that spelling is all a matter of science, not of sentiment. This is quite in keeping with the samples of the reform put forth in the strange vocabulary which illustrates it to the eye—only that that vocabulary is not at all practical, and is very far from being scientific. The more practical we are, the more skeptical we are apt to be of visionary and impracticable reforms. The true practical man is he who uses the language which is established by centuries of usage, the language in which all literature is printed, the language of his newspaper, his office, his profession, his friends, and his correspondents. Our phonetic friends pay a silent tribute to this fact in themselves declining to spell after the bald and truncated method which they advocate. Like some friends of the Maine law, they are in favor of the spelling reform, but opposed to its enforcement—at least until they can get somebody else to enforce it.

We come now to the economical argument. It is asserted that the amended spelling would save one-sixth, or 17 per cent., of writing, of paper, and of printing, and consequently of the cost of all these, estimated (or rather guessed at) at fifteen millions of dollars a year. This calculation must necessarily be based on some other phonetic system than that recommended by the philological societies, because a careful count of their vocabulary of amended spellings proves that in their 3,500 words the saving of letters over the present spellings of the same words is a little less than 13 per cent., or one-eighth instead of one-sixth. But the true comparison lies in finding how much is saved proportionately by these amended spellings in the whole current vocabulary of the language in which they

may be used. Taking this at 75,000 words (a very low minimum estimate for those in current use), we find that the true saving in writing or printing is just three-quarters of one per cent. Is it worth while to disfigure the language so much to gain so very little? In the sample of simplified spelling circulated the other evening, the saving from omitted letters is a little less than 5 per cent.

But what of it? Are we to measure the infinite riches of a great historic language by the petty standard of the counting-house? Are we to cut out of literature every superfluous word, as we are asked to do every superfluous letter out of language? The French Bishop Huet said that all that had been written since the creation of the world might easily be compressed into about seven folio volumes, *provided* nothing were said more than once. That little proviso is fraught with much meaning. But in the process of condensation, while we might possibly lose no facts, we should lose what wondrous wealth of song and story, what triumphs of reason, what endowments of imagination, what splendid models of eloquence!

There are some economies too expensive to be indulged in, and among them is the proposed abolition of the most expressive parts of our words. I don't care if you save fifteen millions, as you say, or twenty-five millions a year, we simply cannot afford it. Money, or the saving of it, is not the chief end of man. Besides, if any really phonetic system is adopted, it is plain that the great body of our literature must be reprinted in it; otherwise foreigners and children will be shut out from its benefits, or else be compelled to learn two systems of spelling instead of one. In the latter case their last state will be far worse than their first; while to republish all our popular books in shortened spelling would cost not fifteen millions, but untold millions of dollars.

Another point: Spelling by sound could never give a uniform pronunciation, even if attempted, because of the variety of sounds given the same letter in different regions. Not to speak of the word "*car*," already mentioned, how could you express phonetically the word *vase*, so as to convey to their respective readers the sound of *vāse* or *vāze* or *vahse* or *vawse*, as pronounced in different regions of the country? To do it you must have as many phonetic systems as there are local peculiarities of speech.

Even many words pronounced alike cannot be written phonetically. Since this debate began, I have a letter from the Pension Office, saying that the writer had made a table of all the spellings of

diarrhœa in pensioners' applications, and that the aggregate of various spellings was 1,690! Is there any phonetic system which could bring about a uniform spelling of that word?

The reformers tell us that *apl* spells apple, and I am not here to deny it. I only say, it is not spelled that way in any dictionary of past or present English, nor in any writer of English, ancient or modern, nor in any newspaper, nor in any counting-house, school, college, shop, store, or family in America or England. Why should it be? Will the learned president of the Philological Association write to his grocer to send him a peck of the best *apls* he has got? Why will he not? Because he has a word-picture in his brain of that fruit, spelled *apple*—a good, round, mouth-filling word, so expressive of the good, round, mouth-filling fruit, that it is inseparably associated with it in the mind of every inhabitant of the land. Yet, because a few philologists have undertaken to reform our spelling, we are to turn our backs upon established usage, unlearn the word-pictures of our whole lives, and learn every puzzle (spelled *puzl*) which we are asked to recommend in the interest of "economy."

Such economy is of most questionable benefit. It degrades our magnificent heritage of speech, the noblest and most expressive language in the world, by destroying or defacing the fair forms, "familiar in our mouths as household words." It rudely tears out the soul and significance of multitudes of our finest expressions of speech, and flings us a barren husk instead.

One speaker answered my colleague, who spoke of the enormity of translating *Psyche* into *Si-ke*: "How many people know anything more than the *sound* of *Psyche*?" I will answer—there are millions. It has been read for centuries in literature, and gazed on with delight in all the grand art galleries of Europe, open freely to all the world. The form of the word has been stereotyped in the brain, not alone of the Greeks who gave it birth, but of all nations in Europe and America, to whom it suggests the immortal story of the soul.

But, we are told, we should have no sentiment about this matter of language—no æsthetic sense—but only hard, upright, down-right logic and common sense. I wish there were some logic in this new-angled vocabulary; but you cannot find it, even with a microscope. There is no time to point out its manifold contradictions, of which a few were named; analyze it, and judge for your-

selves. But as to this suggestion of æsthetics as foreign to the subject we are debating—of the expression of our language—is there anything under heaven more full of the æsthetic sense, more saturated with sentiment, than language? Out of it are builded the most powerful and the most delicate creations of the reason and the imagination of man. It is the vehicle of the subtlest and profoundest thought, the most refined expression, the most beautiful poetry, and the sublimest eloquence. Its rich and infinite suggestiveness, its wealth of imagery, its exuberance of ideas, its exhaustless inspiration, its influence upon human feeling, are bounded only by the limitations of the tongue to which it belongs.

Of all the living languages, I am happy to believe the English to be the paragon. Even the learned speaker himself, when he eulogized our English speech as destined to be the international language, appealed to the æsthetic sense of his hearers, and struck a chord of sentiment which vibrated in every breast.

If you tell me that we must not confound the orthography of language with language itself, I answer that millions of works of human genius and centuries of use have given overpowering weight to the expression of our language as now established. The word-pictures that give expression to all literature are inseparably associated in our minds with the thought which makes the soul of every sentence. Fancy our great poets reprinted in phonetics, with our fine old English speech cropped and butchered and denuded of all unsounded letters, and to most readers the charm which once they knew would be gone forever.

One remark which raised a responsive smile, mingled with some applause, was that we should one day look upon our present words, with their redundant letters, as on a dog with a kettle tied to his tail; and we were told that the spelling reform must make slow progress, since all that could now be done was to cut off the dog's tail by inches. There is a beast-fable in early mythology which relates, that once upon a time certain wiseacres of economical bent among the animals summoned a convention, to consider the great question of the abolition of tails. After much argument, it being contended that tails were useless appendages, destructive to all uniformity, and troublesome to keep in order, it was solemnly resolved that all tails should thenceforth be dispensed with. So the shapely tail of the horse was docked till he could no longer keep off the flies, the dog lost his expressive, wagging organ of interest and at-

tachment, the kitten parted with its waving testimonial of regard, the squirrel laid down his beautiful but useless appendage, the peacock was shorn of its splendid iridescent fan, and all the beasts and birds appeared in a tailless uniform. But very soon they found that a great mistake had been committed. When all were reduced to a uniform level of ugliness, they began to regret the things of beauty and of use so hastily parted with. A new convention was called, and, by a unanimous vote, the lost tails were restored, and the whole race of animals was happy once again. This fable teaches that the radical lopping off of fancied superfluities is not always permanent reform.

BOOK NOTICE.

Hindu Literature; or the Ancient Books of India. By Elizabeth A. Reed. Chicago, 1891. S. C. Griggs & Co.

One has only to look at a collection of works on the Oriental religions to become thoroughly discouraged from attempting to read them. If he has not one hundred years at his disposal he had better not attempt to master the whole subject. In a volume of four hundred pages Mrs. Reed has undertaken to give a brief synopsis of the great Indian Epics in a popular and attractive form, and her volume will be read with great interest.

DEATH OF JOHN G. OWENS.—Mr. J. G. Owens, of Lewisburg, Pa., recently died of yellow fever in Honduras, where he was exploring the ancient ruins and making archeological collections for the Columbian Exposition. Mr. Owens held for two years the Hemenway Fellowship at Harvard University.

THE BRINTON LECTURES.—Five lectures on anthropology were delivered by Dr. J. G. Brinton at the Philadelphia Academy of Sciences, in February and March. The special subjects were: "The Bonds of Social Life," "The Growth of the Arts," "The Progress of Religions," "Language and Literature," and "Folk Lore, or the Past in the Present."

TIME-KEEPING BY LIGHT AND FIRE.

BY WALTER HOUGH.

The wonderful progress in the minification of time and in the whole science of metrology has called increasing attention to the methods of primitive peoples and to the survivals among the civilized. There will soon be a sufficient body of observations to illustrate the early stages of the faculty of estimation and the devices which have grown out of the aggregates of experience.

An almost unnoticed fact in the history of time-keeping is the use of fire and light for measuring and checking time.

The first employment of time-checks based upon the steady consumption of combustible substances by fire is to mark off short periods, rather than to keep a continuous record of time. This is in accord with the appreciation of the value of time in the unrefined states of culture.

The observation of the heavenly bodies in a rough way, or the progress of a shadow in grass, or later the march of the shadow upon the dial, all growing out of planetary motion, seem often to have given place to the wasting of fire and the flowing of sand or water. The aid of fire becomes of value when it is desired to record the passage of a night, when the burning of a homogeneous, tinder-like branch, or a torch might give a fair estimate of the loss of time when the heavenly bodies were hidden.

Most of the Pacific Islanders burn torches of the oily nuts of the "candle-nut tree," *Aleurites triloba*, by skewering a number of the kernels on a long palm-leaf midrib and lighting the upper one. The kernels are of nearly uniform size, and burn with a clear bluish flame, consuming in about ten minutes to a fungus, which, when the nut below is ignited, must be removed by some one in attendance. The Marquesans tie bits of tapa at intervals along the torch, and thus have invented a clock.

In China there are many examples of a similar measurement of time. The prescribed time during which the royal procession at the coronation of the emperor must move through the distance between the palace and the temple is regulated by a functionary

who burns a "joss stick" (the traditional incense) of a certain fixed length.¹ At present in China *gong heung*, or time incense, consisting of five sticks made of pressed wood dust, long and short, according to the season, is burnt during the night, which is divided into five watches. A bundle of these sticks from Canton, presented by Stewart Culin, is in the U. S. National Museum; they are about one-quarter of an inch in diameter and 16 inches long.

"Professor Mason referred to a simple time-check used by Chinese physicians. It was a joss-stick broken so as to have several angles. The doctor set fire to one end and instructed his patient to take his first dose when the fire reached the first angle, another when it reached the second, and so on."²

In Western China, along the Yellow river, "the water is raised by immense wheels, generally fifty to sixty feet in diameter; they belong to villages and in a few cases to individuals, who, for a small consideration, sell the water to the peasants. The price is calculated by the quantity which flows from the wheel while a given length of joss-stick burns."³

Chinese messengers who have but a short period to sleep, awake themselves by putting a lighted bit of joss-stick between the toes. This acts as an alarm and stimulus at the proper moment.

In Korea, the regulation and recording of time is intrusted to certain petty officials, who tell the time by what is called the "dew clock," and which is probably a clepsydra. The night up to twelve o'clock is divided into five parts, *giung*, and these into five smaller, *jiun*, which are announced by a drum and gong. At twelve o'clock the record ceases and the gates are opened. The palace clock is an oiled paper lantern, inclosing and screening from the wind a rope of hemp soaked in niter, called "fire rope," *hwa-sung*, which burns steadily. Each hour is divided into four parts by cords tied to the rope, and the latter is kept burning continuously. Time is announced by a lantern having transparent slides marked with the different *giung*, placed before the king's window. An officer takes charge of this clock, and the perpetuation of the custom seems due more to deference for tradition than for any practical purpose. It is probably of some value as a check upon the "dew clock." The Koreans also reckon time by the number of pipes smoked. Thus,

¹ Douglas, China.

² The American Anthropologist, I, January, 1888, p. 49.

³ W. W. Rockhill: The Land of the Lamas, p. 42.

you will hear them say, "He only stopped long enough to smoke one pipe."¹

It seems probable that the idea of utilizing flame and fire for the purpose under consideration has occurred to minds in diverse periods and places. The candle-clock of King Alfred, by which time was reckoned through the wasting of measured candles shielded behind screens of horn, is well known, and marks an advance upon the former crude estimations. King Alfred's device seems to have been a more complete adaptation of the familiar use of a certain length of candle as a time-check.

Marked candles, "King Alfreds," can still be procured in England, where these are said to be used in Catholic churches. There is a pair in our National Museum, each divided into ten sections. During the Middle Ages, in France it was customary to divide the night period by means of candles. In the literature there are allusions to events happening at one, two, or three "candles of the night" (*chandelle de nuit*).

In the monasteries, also, when the stars were obscured the watchers chanted prayers or psalms of a known length to gauge the intervals elapsing.

The use of the candle time-check was widespread in Europe, and still survives in a few places. A late notice is found in the *Heilenkirchener Zeitung* of Aachen, Germany, for November 22, 1890, where tax sales are advertised of parcels of land to be sold "bei brennenden lichte." "Auction by candle" and "excommunication by candle" are well-known expressions, and even "courting by length of candle" is familiar. In the ancient Hungarian folk-tale "Prince Unexpected," the ogre Bony lights a straw and the Prince must stitch a pair of boots before it goes out or lose his life.²

In view of the antiquity of the candle, which was well known alike to the Romans and Norsemen, and presumably by the Egyptians and Babylonians, is it not probable that its value as a time indicator may have been observed and applied by these peoples? A cuneiform sign preserves the primitive fire-drill of the aboriginal Akkadians;³ a similar clue with regard to time-keeping may link the Euphrates with the Hoang-ho.

¹ Rockhill, *Laws and Customs of Korea*, Am. Anthropol., iv, 1891, p. 183.

² Folk-Lore Jour., ii, Jan.-Dec., 1881, p. 14.

³ Aboriginal Fire-Making, Am. Anthropol., vol. III, 1890, p. 359.

A later development of the use of flame in time-keeping are the lamp-clocks in vogue in Europe up to the XVIII century. The specimen preserved in Cluny Museum consisted of an elongated upright reservoir, graduated into six or more divisions, and the wick-carrier resembled in shape the ancient gravy-bowl lamp. They were thought a success in spite of the number of causes which would render this time-keeping device inaccurate. There is some evidence as to when this lamp was invented: "En 1670, le père Lana (Ed. Fournier Le Vieux Neuf, t. 1, p. 20) avait construit une lampe indiquant les heures, qui devait être analogue à l'appareil que nous venons de décrire."¹ The author cited describes a lamp of this character in his collection.

THE MEANS OF DISTINGUISHING JADEITE AND NEPHRITE BY SPECIFIC GRAVITY.—Professor Mason, in his review of my paper on jade (vol v, p. 246, July, 1892), says: "The author calls in question somewhat the conclusion of Clarke and Merrill that specific gravity is the best practical means of distinguishing jadeite and nephrite, but his tables (p. 40) show that all jadeites are above 3.27 and all nephrites not only below that, but generally 3 or less." This remark of Professor Mason can only have been made by oversight, as my tables prove just the contrary. I enumerate jadeites with a lower specific gravity from the following localities:

America, from Mexico to Brazil.....	2.87-3.11
Asia: Barma.....	2.97-3.07
France.....	3.16
New Guinea.....	3.06

Others could be added. Even chloromelanite, which is said to possess a specific gravity of 3.40-3.65 (Damour), occurs in New Guinea with 3.16. The statement of Clarke and Merrill (Pr. U. S. Nat. Mus., 1888, xi, 129), that "the only practical means of distinguishing between the two substances . . . would seem to be by their specific gravities," therefore by no means holds good. The microscopical and, in certain cases, even the chemical analysis must often be added, if one wishes to get a safe diagnosis. If one is not permitted to damage the object, a trustworthy diagnosis between jadeite and nephrite cannot be made at all. (Compare Arzruni's remarks: *Zeit. für Ethn.*, 1892, p. 32.) A. B. MEYER.

DRESDEN, GERMANY.

¹ Henry-René D'Allemagne, *Histoire de luminaire depuis l'époque romain jusqu'au XIX siècle*. Paris, 1891, p. 283.

A QUARTERLY BIBLIOGRAPHY

OF

ANTHROPOLOGIC LITERATURE.

COMPILED BY ROBERT FLETCHER, M. D.

- Alexander** (Ja. B.) The dynamic theory of life and mind: an attempt to show that all organic beings are both constructed and operated by the dynamic agencies of their respective environments. Minneapolis, 1893 [1892], Pub. by the author, 10 + 1067 p. 8°.
- Apfelstedt** (Carl). Beitrag zur Kasuistik der Missbildungen des äusseren Ohres. Jena, 1892, G. Neuenhahn, 37 p. 8°.
- Beyer** (Ernst). Untersuchung der Skelettteile aus einem Gräberfelde bei Illkirch. Strassb., 1892, C. Gœtlicher, 64 p. 8°.
- Blumenfeld** (Arthur). Die Lendenkrümmung der Wirbelsäule bei verschiedenen Menschenrassen. Berl., 1892, H. Lesser, 42 p. 8°.
- Bruel** (H.). Étude archéologique sur le château et le village d'Opoul jusqu' au xvii^e siècle. Opoul, 1893, Perpignan, 25 p. 8°.
- Bruno**. L'âge de pierre en Touraine. Atelier préhistorique du Grand-Pressigny, l'un des plus vastes du globe, s'étendant sur les communes de Chaumussay, Abilly, Barrow, la Guerche, et sur toute la contrée circonvoisine. Tours, 1892, Deslis frères, viii, 64 p. 8°.
- Bruno** (Bernard). Die Cretine Pöhl. Ein Beitrag zur Kenntniss der Cretinen. Würzb., 1892, Stäkel, 32 p. 8°.
- Cabadé** (E.) La responsabilité criminelle. Paris, 1893, G. Masson, 350 p. 12°.
- Chauvin** (Jeanne). Étude historique sur les professions accessibles aux femmes. Influence du sémitisme sur l'évolution de la position économique de la femme dans la société. Paris, 1892, Giard et Brière, 296 p. 8°.
- Chevalier** (J.) Une maladie de la personnalité; l'inversion sexuelle; psycho-physiologie; sociologie; tératologie; aliénation mentale; psychologie morbide; anthropologie; médecine judiciaire. Préface du Dr. A. Lacassagne. Lyon & Paris, 1893, A. Storck, 550 p. 12°.
- Fourdrignier** (Edouard). Étude sur les bracelets et colliers gaulois, accompagnée de 2 planches et fig. dessinées par l'auteur d'après les originaux. Notes archéologiques. Versailles, 1892, Cerf. et Ce., Paris, 28 p. 8°.
- Gauokler** (E.) Les tendances nouvelles du droit pénal et le troisième congrès d'anthropologie criminelle. Paris, 1892, Pichon, 24 p. 8°.
- Gaudenzi** (Charles). Un appareil rapide de craniographie exacte. Bologne, 1892, Zamorini e Albertazzi, 14 p., 2 pl. 8°.
- Grinnell** (G. Bird). Blackfoot lodge tales: the story of a prairie people. New York, 1892 [1893], Scribner's Sons, 12 + 310 p. 12°.
- Gurrieri** (Raffaele) e Ettore Fornasari. I sensi e le anomalie somatiche nella donna normale e nella prostituta. Torino, 1893, frat. Bocca, 38 p. 8°.

- Haeckel** (Ernst). The history of creation; or, the development of the earth and its inhabitants by the action of natural causes. A popular exposition of the doctrine of evolution in general, and of that of Darwin, Goethe and Lamarck in particular. From the 8th German edition. Revised by Prof. E. Ray Lankester. 4th English edition. New York, 1892, D. Appleton & Co. 12°, 2 vols.
- Hamy** (E. T.) Hommage à la mémoire de M. A. de Quatrefages de Bréau. Paris, 1892, Burdin et Ce., 24 p. 8°.
- Harou** (Alfred). Contributions au folklore de la Belgique. Paris, 1892, Lechevalier, xii, 94 p. 18°.
- Hermaphrodite** (l') de Panormita (Antonio Beccadelli) (xv^e siècle). Traduit pour la première fois. Avec le texte latin et un choix de notes de Forberg. Paris, 1892, Liseux, xix, 156 p. 8°.
- ten Kate** (H.) Contribution à la craniologie des Araucans Argentins. La Plata, 1893, 12 p., 2 pl. 8°.
- Lagneau** (Gustave). Conséquences démographiques qu'ont eues pour la France les guerres depuis un siècle. Paris, 1892, Girardot, 72 p. 8°.
- Lefèvre** (André). Les races et les langues. Paris, 1893, F. Alcan, 301 p. 8°.
- MacDonald** (Arthur). Criminology. With an introduction by Dr. Cesare Lombroso. New York, 1893, Funk & Wagnalls Co., xiv, 416 p. 8°.
- MacRitchie** (D.) The Ainos. Leiden, 1892, 85 p., 20 pl., 4°. [Suppl. to vol. iv of: Internat. Arch. f. Ethnog.]
- de Nadaillac, Marquis**. Manners and monuments of prehistoric peoples; Translated by Nancy Bell (N. D'Anvers). New York, 1892, G. P. Putnam's Sons, 10 + 412 p. 8°.
- L'homme. Paris, 1892, Soye et fils, 41 p. 8°.
- Le problème de la vie. Paris, 1893, G. Masson, 295 p. 12°.
- Nuova rivista di psichiatria, neuropatologia, medicina legale, antropologia criminale e terapia**. Giornale clinico, sperimentale, illustrato, quindicinale. Anno I, 1892. Napoli, 1892, fol.
- Ottolenghi** (S.) La donna delinquente in rapporto alla psichiatria forense. Torino, 1892, L. Roux e C. 28 p. 8°.
- Petitot** (E.) La sépulture dolménique de Mareuil-lès-Meaux (Seine-et-Marne), et ses constructeurs. Paris, 1892, Émile Bouillon. 18°.
- Riddles of the sphinx: a study in the philosophy of evolution; by a troglodyte**. N. Y., 1893, Macmillan & Co., 27 + 468 p. 8°.
- Schaeffer** (Oskar). Untersuchungen über die normale Entwicklung der Dimensionsverhältnisse des fötalen Menschenschädels mit besonderer Berücksichtigung des Schädelgrundes und seiner Gruben, mit einer Vorrede von Johannes Ranke. Ontogenetische, vergleichend-anatomische und foetal-anthropologische Studien. München u. Leipzig, 1892, J. F. Lehmann, 55 p., 5 pl. 4°.
- Sighele** (Scipio). La coppia criminale. Studio di psicologia morbosa. Torino, 1893, frat. Bocca, 171 p. 8°.
- Sociology**: popular lectures and discussions before the Brooklyn Ethical Association. [New issue.] Chicago, 1893, C. H. Kerr & Co., 10 + 403 p. 12°.
- Strahan** (S. A. K.) Marriage and disease: a study of heredity and the more important family degenerations. N. Y., 1892, D. Appleton & Co., 334 p. 12°.
- Vidal** (Georges). État actuel de l'anthropologie criminelle (à propos d'un ouvrage de M. Lucchini). Toulouse, 1892, Lagarde & Sebillé, 66 p. 8°.
- Weismann** (August). Aufsätze über Vererbung und verwandte biologische Fragen. Jena, 1892, G. Fischer, 853 p. 8°.

Weismann (August). Das Keim-plasma. Eine Theorie der Vererbung. Jena, 1892, G. Fischer, 646 p. 8°.

Whitney (W. D.) Max Müller's science of language. New York, 1892 [1893], Appleton, 79 p. 12°.

Zernoff (D. N.) [Application of the encephalometer for defining in living man the convolutions of the brain.] Moskva, 1892, S. P. Jakovleff, 12 p., 1 pl. 8°.

Abbott (C. C.) The so-called "Cache" implements. Science, N. York, 1893, xxi, 122.—**Allen** (G.) Ghost worship and tree worship. Pop. Sc. Month., N. Y., 1892-3, xlii, 489; 648.—**D'Alviella** (G.) L'influence des astres dans la destinée des morts. Un chapitre d'astrologie primitive. Résumé. Bull. Soc. d'anthrop. de Brux. 1891-2, x, 1892, 171.—**Ammon** (O.) La sélection naturelle chez l'homme. Anthropologie, Par., 1892, iii, 720-736.—**Andrews** (Miss E. F.) Will the coming woman lose her hair? Pop. Sc. Month., N. Y., 1892-3, xlii, 370-372.—**Arbo**. Bidrag til Kundskab om Færøernes Beboers Anthropologi og specielt kraniologiske Forhold. [Anthropology and specially craniological relations of the inhabitants of Faroe islands.] Ugesk. f. Læger, Kjøbenhavn, 1892, 4. R., xxvi, 362-366.—**Aubry** (P.) Une famille de criminels; note pour servir à l'histoire de l'hérédité. Ann. méd.-psych., Par., 1892, 7. s., xvi, 429-441.—**Audibert** (A.) De la condition des fous et des prodiges en droit romain et de l'influence que la science médicale a exercée en ces matières sur l'évolution du droit. Arch. de l'anthrop. crim., Par., 1892, vii, 593-608.—**Bacot** (W.) Cases of earth-eating in North Queensland. Australas. M. Gaz., Sydney, 1891-2, xi, 430.—**Bandelier** (A. F.) An outline of the documentary history of the Zushi tribe. J. Am. Eth. & Arch., Bost. & N. Y., 1892, iii, 1-115.—**Barnum** (Mrs. Clara Kempton). Totemism in the evolution of theology. Pop. Sc. Month., N. Y., 1892-3, xlii, 395-404.—**Beauchamp** (W. M.) Rhymes from old powder-horns. J. Am. Folk-Lore, Bost. & N. Y., 1892,

v, 284-290, 2 pl.—**Becker** (P.) Eine neue Hausurne mit Pferdeköpfen am Dache von Hoyman. Verhandl. d. Berl. Anthropol. Gesellsch., 1892, xxiv, 352-357.—**Bédart**. Ectrodactylie quadruple des pieds et des mains se transmettant pendant trois générations. Bull. Soc. d'anthrop. de Par., 1892, 4. s., iii, 336-342. — Quelques cas rares d'anomalies musculaires observés à Toulouse au laboratoire d'anatomie. *Ibid.*, 376-379. — Veine cave supérieure située à gauche. *Ibid.*, 379.—**Benedikt** (M.) Die Benennungsfrage in der Schädellehre. Mitth. d. anthrop. Gesellsch. Wien, 1892, xxii [Sitzungsb.], 101-105.—**Bent** (J. T.) On the finds at the Great Zimbabwe ruins (with a view to elucidating the origin of the race that built them. J. Anthropol. Inst., Lond., 1892-3, xxii, 124-136, 5 pl.—**Bérard** (A.) Les hommes et les théories de l'anarchie. Arch. de l'anthrop. crim., Par., 1892, vii, 609-636.—**Bernheim**. L'organisme humain. Rev. méd. de l'est, Nancy, 1892, xxiv, 673-685.—**Bertilion** (A.) Tableau des nuances de l'iris humain. Bull. Soc. d'anthrop. de Par., 1892, 4. s., iii, 384-387.—**Blasius** (W.) Die neuen Funde in der Baumannshöhle bei Rübeland am Harz. Mitth. d. anthrop. Gesellsch. Wien, 1892, xxii [Sitzungsb.], 107.—**Blodgett** (J. H.) The rural school problem. Am. Anthropologist, Washington, 1893, vi, 71-78.—**Boas** (F.) Notes on the Chinook language. *Ibid.*, 55-63. — Sagen der Indianer in Northwest-America. Verhandl. d. Berl. Gesellsch. f. Anthrop., Berl., 1892, xxiv, 314-336.—**Bordier**. Le sifflet chez les peuples primitifs. Bull. Soc. d'anthrop. de Par., 1892, 4. s., iii, 15-24 [Discussion], 28.—**Boulland** (H.) Des plis du pavillon de l'oreille au point de vue de l'identité. Limousin méd., Limoges, 1892, xvi, 153-158.—**Brabrook** (E. W.) Ethnographical survey of the United Kingdom. Science, N. Y., 1893, xxi, 5. — On the organization of local anthropological research. J. Anthropol. Inst., Lond., 1893, xxii, 262-274.—**Brinton** (D. G.) Further notes on the Betyoa dialects; from unpublished sources. Proc. Am. Phil. Soc., Phila., 1892, xxx, 271-278. — The Etrusco-Libyan

- elements in the song of the Arval brethren. *Ibid.*, 317-324.—**Brown** (J. A.) On the continuity of the palæolithic and neolithic periods. *J. Anthropol. Inst.*, Lond., 1892-3, xxii, 66-98, 4 pl.—**Browne** (C. R.) Some new anthropometrical instruments. *Proc. Roy. Irish Acad.*, Dubl., 1891-2, 3. s., ii, 397-399.—**Browne** (Sir J. C.) Sex in education. *Tr. M. Soc. Lond.*, 1891-2, xv, 405-436.—**Brunton** (T. L.) The correlation of structure, action, and thought. *Lancet*, Lond., 1893, i, 3-9, 1 pl. *Also*, *Pop. Sc. Month.*, N. Y., 1892-3, xlii, 749-764.—**Carrara** (M.) Di alcune anomalie scheletriche nei criminali. *Gior. d. r. Accad. di med. di Torino*, 1892, 3. s., xl, 549-563.—**Carwardine** (T.) The suprasternal bones in man. *J. Anat. & Physiol.*, Lond., 1892-3, xxvii, 232-234, 1 pl.—**Chamberlain** (A. F.) A Mississaga legend of Nā' nibōjū'. *J. Am. Folk-Lore*, Bost. & N. Y., 1892, v, 291.—**Chapman** (Mary). Notes on the Chinese in Boston. *Ibid.*, 321-324.—**Claypole** (E. W.) Prof. G. F. Wright and his critics. *Pop. Sc. Month.*, N. Y., 1892-3, xlii, 764-781.—**Collignon** (R.) Crânes de la nécropole phénicienne de Mahédia (Tunisie). *Anthropologie*, Par., 1892, iii, 163-173.—**Communication** de MM. Fagès et De Meester à propos de la découverte d'un squelette néolithique à Bernissart. *Bull. Soc. d'anthrop. de Brux.* 1891-2, x, 1892, 137-140, 1 pl.—**Cramer** (F.) The logic of organic evolution. *Pop. Sc. Month.*, N. Y., 1892-3, xlii, 384-391.—**Cresson** (H. T.) Brief remarks upon the alphabet of Landa [Abstr.]. *Proc. Am. Ass. Adv. Sc.*, Salem, 1892, xli, 281-283.—**Dames** (W.) Die ersten Spuren von Organismen auf der Erde. *Deutsche Rev.*, Bresl. u. Berl., 1892, xviii, 38-49.—**Decrow** (G.) Folk-lore from Maine. *J. Am. Folk-Lore*, Bost. & N. Y., 1892, v, 318-320.—**De Puydt**. Quelques observations sur les fonds de cabanes néolithiques de la Hesbaye. *Bull. Soc. d'anthrop. de Brux.* 1891-2, x, 1892, 144-160, 1 pl.—**Dixon** (W. A.) The morbid proclivities and retrogressive tendencies in the offspring of mulattoes. *J. Am. M. Ass.*, Chicago, 1893, xx, 1.—**Dorsey** (J. O.) Nanibozhu in Siouan mythology. *J. Am. Folk-Lore*, Bost. & N. Y., 1892, v, 293-304.—**Rising** and falling of the sky in Siouan mythology. *Am. Anthropologist*, Washington, 1893, vi, 65-69.—**Douglas** (R. K.) The social and religious ideas of the Chinese, as illustrated in the ideographic characters of the language. *J. Anthropol. Inst.*, Lond., 1892-3, xxii, 159-173.—**Ehrenreich** (P.) Süd-amerikanische Stromfahrten. *Globus*, Braunschweig, 1892, lxii, 326-331.—**Einfluss** (Der) des Handgebrauchs auf die Darstellung von Zahlen. *Ibid.*, 1893, lxiii, 43-47.—**Ellis** (A. B.) Marriage and kinship among the ancient Israelites. *Pop. Sc. Month.*, N. Y., 1892-3, xlii, 325-337.—**Evans** (E. P.) The æsthetic sense and religious sentiment in animals. *Ibid.*, 472-481.—**Felkin** (R. W.) Neue ethnographische Gegenstände aus Ost-Africa. *Verhandl. d. Berl. Gesellsch. f. Anthrop.*, Berl., 1892, xxix, 297-301.—**Ferrero** (G.) Les fêtes criminelles. *Rev. scient.*, Par., 1893, li, 42-47.—**Feyerabend**. Beziehungen der Ober-Lausitz zum Süden in vorgeschichtlicher Zeit. *Verhandl. d. Berl. Anthrop. Gesellsch.*, 1892, xxiv, 410-416.—**Force** (M. F.) Origin of certain mound relics. *Am. Anthropologist*, Washington, 1893, vi, 113-115.—**Frank**. Ueber einen Fall von Hermaphroditismus. *Prag. med. Wehnschr.*, 1892, xvii, 221.—**Fraser** (W.) On "sickles" (so-called) of bronze, found in Ireland: with a list of those already discovered. *Proc. Roy. Irish Acad.*, Dublin, 1892, ii, 381-390, 2 pl.—**Gaillard**. Le dolmen de la pointe de Conguel à Quiberon. *Bull. Soc. d'anthrop. de Par.*, 1892, 4. s., iii, 37-48.—**Garson** (J. G.) A description of the skeletons found in Howe Hill Barrow. *J. Anthropol. Inst.*, Lond., 1892-3, xxii, 8-20, 1 tab.—**Geographic** nomenclature of the District of Columbia. A report. *Am. Anthropologist*, Washington, 1893, vi, 29-53.—**Gifford** (J.) Attakapas country. *Science*, N. York, 1892, xx, 372.—**Gros** (H.) Crânes et encéphale océaniens. *Bull. Soc. d'anthrop. de Par.*, 1892, 4. s., iii, 54-56.—**Gross** (V.) Eine sonderbare Bronzenadel mit 5 gestielten Knöpfen von Estavayer. *Verhandl. d. Berl. Gesellsch. f. Anthrop.*, Berl., 1892, xxiv, 282-285.—**Hartmann** (R.) Schuli-Neger. *Ibid.*,

270-272.—**Heger** (F.) Goldgeräthe von den Philippinen. Mitth. d. anthrop. Gesellsch. Wien, 1892, xxii, 216-220.—**Heierli** (J.) Tène-Gräber im Canton Graubünden. *Ibid.* [Sitzungsb.], 92.—**Hervé** (G.) Le crâne de Canstadt. Bull. Soc. d'anthrop. de Par., 1892, 4. s., iii, 365-376. — Crâne de jeune gorille. *Ibid.*, 387-389. — Le squelette humain de Brunn [Rev.]. Rev. mens. de l'Ecole d'anthrop. de Par., 1893, iii, 20-24.—**Hewitt** (J. N. B.) The whistle language of the Canary Islanders. Am. Anthropologist, Washington, 1893, vi, 115.—**Hill** (D. J.) The festival development of art. Pop. Sc. Month., N. Y., 1892-3, xlii, 734-749.—**Hins** (W.) Die Entwicklung der menschlichen und thierischen Physiognomien. Arch. f. Anat. u. Entwicklungsgesch., Leipz., 1892, 384-424.—**Holmes** (W. H.) Pottery of the Rio San Juan. Great Divide, Denver, 1893, ix, 2. — Evolution of the aesthetic. Proc. Am. Ass. Adv. Sc., Salem, 1892, xli, 239-255. — Sacred pipestone quarries of Minnesota and ancient copper mines of Lake Superior. *Ibid.*, 277-279. — Gravel man and palæolithic culture; a preliminary word. Science, N. Y., 1893, xxi, 29. — Distribution of stone implements in the tidewater country. Am. Anthropologist, Washington, 1893, vi, 1-14, 1 l., 2 pl.—**Hoops** (J.) Die Ergebnisse von Flinders Petries zehnjährigen Ausgrabungen in Ägypten. Globus, Braunschweig, 1892, lxii, 291; 307.—**Hough** (W.) A rare form of polished stone implements and their probable use. Science, N. Y., 1893, xxi, 5. — Balances of the Peruvians and Mexicans. *Ibid.*, 30.—**Jentsch** (H.) Vorslavische und slavische Gräberfunde aus dem Gubener Kreise. Verhandl. d. Berl. Gesellsch. f. Anthrop., Berl., 1892, xxiv, 274-277.—**Jones** (P. M.) Indian obstetrics in Central America. Brooklyn M. J., 1893, vii, 97-100.—**ten Kate** (H. F. C.) Somatological observations on Indians of the Southwest. J. Am. Ethn. & Arch., Bost. & N. Y., 1892, iii, 119-144.—**v. Kaufmann** (R.) Ein antikes Modell des ägyptischen Labyrinths. Verhandl. d. Berl. Gesellsch. f. Anthrop., Berl., 1892, xxiv, 302-311.—**Knöchernen**

(Die) Merkpunkte in den verschiedenen Gegenden der Körperoberfläche; eine anatomische Studie zum Zweck der Anfertigung von Unfallgutachten. Cor.-Bl. d. allg. ärztl. Ver. v. Thüringen, Weimar, 1892, xxi, 353-376.—**Knöpfner** (L.) Un cachet d'oculiste romain au musée lorrain de Nancy. Rev. méd. de l'est, Nancy, 1893, xxv, 6-19.—**Laborde** (J.-V.) Coup d'œil historique sur les origines et la fonction du langage; influence des idées et des écoles philosophiques sur l'évolution et le progrès de nos connaissances relatives à l'origine et à la notion réelle, ou biologique, de cette fonction. Rev. mens. de l'Ecole d'anthrop. de Par., 1893, iii, 1-16, 1 pl.—**Lajard**. La race Ibère (crânes des Canaries et des Açores). Bull. Soc. d'anthrop. de Par., 1892, 4. s., iii, 294-330.—**Lajard** (V.) et **F. Regnault**. De l'existence de la lèpre atténuée chez les cagots des Pyrénées. Progrès méd., Par., 1892, 2. s., xvi, 403; 466; 484; 497.—**Laloy** (L.) Un cas nouveau de polymastie. Anthropologie, Par., 1892, iii, 174-192.—**Lamb** (D. S.) The deadly microbe and its destruction. Am. Anthropologist, Washington, 1893, vi, 15-28.—**Laurent** (E.) Les maladies de la volonté chez les criminels. Ann. méd.-psych., Par., 1892, 7. s., xvi, 404-428.—**Le Bon** (Gustave). The evolution of civilization and the arts. Pop. Sc. Month., N. Y., 1892-3, xlii, 342-349.—**Leclère** (A.) Mœurs et coutumes des Cambodgiens. Rev. scient., Par., 1893, li, 65; 108.—**Lombroso** (C.) Quattro cranii di assassini Ravennati. Gior. d. r. Accad. di med. di Torino, 1892, 3. s., xl, 772-774.—**Lombroso** (C.) e **Monguidi**. Scopertura del canale sacrale in delinquenti. *Ibid.*, 771.—**Longfield** (T. H.) Note on some cinerary urns found at Tallaght, county of Dublin. Proc. Roy. Irish Acad., Dublin, 1892, ii, 400.—**v. Luschan** (F.) Ethnographisches aus der Süd-See. Verhandl. d. Berl. Gesellsch. f. Anthrop., Berl., 1892, xxiv, 293-297.—**McGee** (W. J.) Man and the glacial period. Am. Anthropologist, Washington, 1893, vi, 85-95.—**McVey** (B.) Negro practice. N. Ori. M. & S. J., 1892-3, n. s., xx, 328-332.—**Macdonald** (J.) East Central African customs. J. Anthropol. Inst.,

- Lond., 1892-3, xxii, 99-122. *Also*, Pop. Sc. Month., N. Y., 1892-3, xlii, 689-695.—**Mahoudeau** (P.-G.) Les preuves anatomiques de la descendance de l'homme; nos organes vestigiaires. Rev. mens. de l'École d'anthrop. de Par., 1892, ii, 381-394.—**Manouvrier** (L.) Dissociation de l'exocrâne en lamelles stratifiées, observée sur un crâne de l'époque néolithique. Bull. Soc. d'anthrop. de Par., 1892, 4. s., iii, 383. ——— Squelette humain de l'époque gallo-romaine découvert à Aix-en-Provence. *Ibid.*, 381.—**Mercer** (H.C.) Pebbles chipped by modern Indians as an aid to the study of the Trenton gravel implements. [Abstr.] Proc. Am. Ass. Adv. Sc., Salem, 1892, xli, 287-289.—**Messikommer** (H.) Aeltere Masken aus der Schweiz. Internat. Arch. f. Ethnog., Leiden, 1892, v, 239.—**Meyners d'Estrey**. Étude ethnographique sur le lézard chez les peuples malais et polynésiens. Anthropologie, Par., 1892, iii, 711-719. **Miles** (M.) Heredity of acquired characters. Proc. Am. Ass. Adv. Sc., Salem, 1892, xli, 202-211.—**Minkiewicz** (J.) Obyczaje Chwosurów w stosunkach do ciemnych i poloniz. [Customs of the Chwosurians in relation to pregnant and puerperal women.] Pam. Towarz. Lek. Warszaw, 1892, lxxxviii, 843-862.—**Moorehead** (W. K.) The ruins of southern Utah. Proc. Am. Ass. Adv. Sc., Salem, 1892, xli, 291-294.—**Morris** (R. T.) Is evolution trying to do away with the clitoris? Am. J. Obst., N. Y., 1892, xxvi, 847-858. *Also*, [transl. Abstr.], Gaz. de gynéc., Par., 1893, viii, 2-10.—**de Mortillet** (G.) Sépultures nouvellement découvertes aux Baoussé-Roussé (près de Menton). Bull. Soc. d'anthrop., Par., 1892, 4. s., iii, 442-450. ——— Présentation de moulage d'un fragment de mâchoire de singe fossile. *Ibid.*, 479.—**Mortimer** (J. R.) An account of the exploration of Howe Hill Barrow, Dugleby, Yorkshire. [Abstr.] J. Anthropol. Inst., Lond., 1892-3, xxii, 3-8.—**Müller** (O.) Eine vierte Urne mit ornamentalen Zeichnungen menschlicher Figuren vom Burgstall bei Oedenburg. Mith. d. anthrop. Gesellsch. Wien, 1892, xxii [Sitzungsb.], 105.—**N** (W. W.) Old English songs in American versions. J. Am. Folk-Lore, Bost. & N. Y., 1892, v, 325.—**Näcke** (P.) Verbrechen und Wahnsinn beim Weibe; statistische klinische und anthropologische - biologische Untersuchungen. Allg. Ztschr. f. Psychiat., etc., Berl., 1892-3, xlix, 396-484.—**Nassau** (R. H.) Native African child-marriage: its relation to uterine disease and difficult parturition. J. Am. M. Ass., Chicago, 1893, xx, 87-89.—**Noel** (P.) Transformations successives dans la construction des coques de phryganes. Bull. Soc. d'anthrop. de Par., 1892, 4. s., iii, 48-53.—**Novicow** (J.) La théorie de Darwin et la justice. Rev. scient., Par., 1893, li, 112-117.—**Pasquarelli** (M.) Inchiasta psicologica attraverso i proverbi; pagina di psicologia di un Paese di Basilicata al Prof. Angelo Zuccarelli. Anomalo, Napoli, 1892, iv, 22; 80; 120; 149; 184; 228.—**Patrick** (G. T. W.) Number forms. Pop. Sc. Month., N. Y., 1892-3, xlii, 504-514.—**Peal** (S. E.) On the morong, as possibly a relic of pre-marriage communism. J. Anthropol. Inst., Lond., 1892-3, xxii, 244-261, 8 pl.—**Penhallow** (D. P.) Epitaphal inscriptions. J. Am. Folk-Lore, Bost. & N. Y., 1892, v, 305-317.—**Petitot** (É.) La sépulture dolménique de Mareuil-les-Meaux (Seine et Marne). Bull. Soc. d'anthrop. de Par., 1892, 4. s., iii, 344-361.—**Piette**. L'équidé tacheté de Lourdes. *Ibid.*, 436-442, 3 pl.—**Pilgrim** (C. W.) Genius and suicide. Pop. Sc. Month., N. Y., 1892-3, xlii, 361-369.—**Plancarte** (F.) Archeologic explorations in Michoacan, Mexico. Am. Anthropologist, Washington, 1893, vi, 79-84.—**Prehistoric** trepanning. [From: Cornhill Mag.] Pop. Sc. Month., N. Y., 1892-3, xlii, 535-542.—**Rahon** (J.) Sex-digitaire atteint de syndactylie partielle. Bull. Soc. d'anthrop. de Par., 1892, 4. s., iii, 334-336. ——— La taille humaine aux époques préhistoriques. *Ibid.* [Discussion], 391-397.—**von Ranke** (H.) Ueber Hochäcker. Beitr. z. Anthropol. u. Urgesch. Bayerns, München, 1892, x, 141-180, 13 ch., 2 pl.—**Regnault** (F.) Une observation de pied préhensile. Bull. Soc. d'anthrop. de Par., 1892, 4. s., iii, 342-344. ——— Présentation d'une hotte primitive. *Ibid.*, 471-479.—**Richer** (P.) Canon des proportions

du corps humain. N. iconog. de la Salpêtrière, Par., 1892, v, 310-328. *Also*, Rev. scient., Par., 1892, I, 558-564.—**Rivière** (E.) Sur la découverte d'une nouvelle sépulture dans une grotte, près de Menton. Bull. Soc. d'anthrop., Par., 1892, 4. s., iii, 459-464.—**Rosendahl** (H. V.) Statistiska förhallanden bland Sveriges nomadfolk. [Statistical account of the nomadic people of Sweden.] Hygiea, Stockholm, 1892, liv, 516-529.—**Roth** (H. L.) On the signification of couvade. J. Anthropol. Inst., Lond., 1892-3, xxii, 204-243.—**Roussel** (T.) Les Cagots, leur origine, leur postérité et la lèpre. Bull. Acad. de méd., Par., 1892, 3. s., xxviii, 753-764.—**Salmon** (P.) La galerie couverte des Pierres-Plates, commune de Locmariaquer (Morbihan). Rev. mens. d. l'École d'anthrop., Par., 1893, iii, 17-19.—**Saville** (M. H.) Explorations of the main structure of Copan, Honduras. [Abstr.] Proc. Am. Ass. Adv. Sc., Salem, 1892, xli, 271-275. — Vandalism among the antiquities of Yucatan and Central America. Science, N. York, 1892, xx, 365.—**Schumann**. Ueber gegossene und getriebene Bronz-Hohlwülste aus Pommern. Verhandl. d. Berl. Anthropol. Gesellsch., 1892, xxiv, 361-366.—**Segel** (B. W.) Jüdische Wundermänner. Globus, Braunschweig, 1892, lxii, 312-314; 331-334; 343-345.—**Seidel** (H.) Paul Crampels Reise vom Ubangi zum Tschad. *Ibid.*, 357; 372.—**Seler**. Is the Maya hieroglyphic writing phonetic? Science, N. Y., 1893, xxi, 6-10.—**Silló y Cortes** (C.) La criminalità nella Spagna. Scuola positiva, Napoli, 1892, ii, 161-167.—**Sirét** (L.) Nouvelle campagne de recherches archéologiques en Espagne; la fin de l'époque néolithique. Anthropologie, Par., 1892, iii, 385-404.—**Sorel** (G.) La position du problème de M. Lombroso. Rev. scient., Par., 1893, li, 206-210.—**Stevenson** (A.) The speech of children. Science, N. York, 1893, xxi, 118-120.—**Stevenson** (M. C.) Tusayan legends of the snake and flute people. Proc. Am. Ass. Adv. Sc., Salem, 1892, xli, 258-270.—**v. Stoltzenberg** (R.) Spuren der Römer in Nordwest Deutschland, insbesondere über das Deister-Castel, das Standlager

des Varus, und das Schlachtfeld am Angrivarischen Grenzwalde. Verhandl. d. Berl. Gesellsch. f. Anthropol., Berl., 1892, xxiv, 251-270, 1 pl.—**Taniguchi** (K.) [Experimental note on Japanese food.] Chugai Ijishimpo, Tokyo, 1892, no. 303, 6-7, 1 tab.—**Ter Mowsejans** (P.) Das armenische Bauernhaus, ein Beitrag zur Culturgeschichte der Armerien. Mitth. d'anthrop. Gesellsch. in Wien, 1892, n. F., xii, 125-172.—**im Thurn** (E. F.) Anthropological uses of the camera. J. Anthropol. Inst., Lond., 1892-3, xxii, 184-203.—**Tiberghien**. Note sur un cas de phocomélie. Bull. Soc. d'anthrop. de Brux. 1891-2, x, 1892, 162-166, 1 pl.—**Tiessen** (E.) Notiz über verwilderte Menschen in Ungarn. Verhandl. d. Berl. Gesellsch. f. Anthropol., Berl., 1892, xxiv, 279.—**Topinard** (P.) De l'évolution des molaires et prémolaires chez les primates et en particulier chez l'homme. Anthropologie, Par., 1892, iii, 641-710. — Man in nature. [Transl. from: L'homme dans la nature.] Pop. Sc. Month., N. Y., 1892-3, xlii, 445-453.—**Tregear** (E.) The Maoris of New Zealand. *Ibid.*, 781-788.—**Verneau**. La taille des anciens Canariens. Bull. Soc. d'anthrop. de Par., 1892, 4. s., iii, 427-431.—**Verneau** (R.) Nouvelle découverte de squelettes préhistoriques aux Baoussé-Roussé, près de Menton. Anthropologie, Par., 1892, iii, 513-540.—**Vinson** (J.) L'évolution du Bouddhisme. Bull. Soc. d'anthrop., Par., 1892, 4. s., iii, 398-426.—**Virchow** (R.) Batak-Stamm der Rajas. Verhandl. d. Berl. Gesellsch. f. Anthropol., Berl., 1892, xxiv, 242-245. — The problems of anthropology. [Transl. from: Rev. scient., Par.] Pop. Sc. Month., N. Y., 1892-3, xlii, 373-377. — Transformismus und Descendenz. [Transl. from: J. Path. & Bact., Lond., 1892.] Berl. klin. Wehnschr., 1893, xxx, 1-5.—**Vorotynski** (B. I.) [Case of sporadic cretinism.] Vestnik. Klin. i sudebnoi psichiat. i nevropatol., St. Petersburg, 1892, ii, 40-51.—**W.** (L.) Der diluviale Mensch im Löss von Brünn. Globus, Braunschweig, 1893, lxiii, 15.—**Wallace** (D.) On cervical ribs, with example in living subjects. Tr. Med.-Chir. Soc. Edinb., 1891-2, n. s., xi, 24-29.—**Weissenberg** (S.)

Ein Beitrag zur Anthropologie der Turkvölker: Baschkiren und Meschtscherjaken. *Ztschr. f. Ethnol.*, Berl., 1892, xxiv, 181-235, 1 pl.—**West** (G. M.) Worcester school children; the growth of the body, head, and face. *Science*, N. Y., 1893, xxi, 2-4.—**Wilfer** (L.) Die Bevölkerung von Böhmen in vorgeschichtlicher und frühgeschichtlicher Zeit. *Globus*, Braunschweig, 1892, lxii, 369-371.—**Williams** (A. M.) Folk-songs of the civil war. *J. Am. Folk-lore*. Bost. & N. Y., 1892, v, 265-283.—**von Wlislocki** (H.) Tod und Todtenfetische im Volksglauben der Magyaren. *Mitth.*

d'anthrop. Gesellsch. in Wien, 1892, n. F., xii, 172-180.—**Zaborowski**. Sur un crâne préhistorique de Villejuif. *Bull. Soc. d'anthrop.*, Par., 1892, 4. s., iii, 470. ——— Disparité et avenir des races humaines. *Rev. scient.*, Par., 1892, 1, 769; 808.—**Zapf** (L.) Eine alte Felszeichnung im Fichtelgebirge. *Beitr. z. Anthrop. u. Urgesch. Bayerns*, München, 1892, x, 181-184.—**Zavitziano** (S. C.) Un cas de fausse queue, de déviation scoliotique et de difformité des membres inférieurs chez une petite fille. *Gaz. méd. d'Orient.*, Constant., 1892-3, xxxv, 275-277.

ABSTRACT OF THE PROCEEDINGS OF THE ANTHROPOLOGICAL SOCIETY OF WASHINGTON.

FROM JANUARY 5, 1892, TO JANUARY 17, 1893.

186th Regular Meeting, January 5, 1892—Papers read: "Alphonse de Candolle on the Transmission of Acquired Characters," by Lester F. Ward; "The Gobacks," by J. H. Gore. Published in the *Journal of American Folk-Lore*, No. XVII, 1892, pp. 107-109.

187th Regular and 14th Annual Meeting, January 19, 1892—The general secretary and the treasurer submitted reports of the operations of the Society under their respective departments during the year just elapsed. The following amendment to the constitution was adopted: Amend article III by incorporating the following: Any member or any person elected to membership may, on the payment of the sum of fifty dollars at one time, be made a life member and shall enjoy all the privileges of active membership. Officers for the ensuing year were elected as follows: President, J. C. Well- ing; vice-presidents, Garrick Mallery (Section A), L. F. Ward (Section B), J. W. Powell (Section C), O. T. Mason (Section D); general secretary, Frank Baker; secretary to board of managers, Weston Flint; treasurer, Perry B. Pierce; curator, H. W. Hen- shaw; councilors, J. Howard Gore, W. H. Holmes, D. S. Lamb, W. J. McGee, F. A. Seely, Thomas Wilson.

188th Regular Meeting, February 2, 1892—The annual report of the curator was read and accepted. The chairman appointed a committee to audit the treasurer's accounts. Papers read: "Ancient Fortifications in Southern Europe," by Thomas Wilson; "The Atlatl," by O. T. Mason, to be published in the Proceedings of the United States National Museum for 1892.

189th Regular Meeting, February 16th, 1892—Papers read: "The Concepts of Justice," by J. W. Powell; "Materials, Tools, and Processes of the Aboriginal Lapidary," by J. D. McGuire. Published in the *American Anthropologist*, vol. V (1892), p. 165.

190th Regular Meeting, March 1, 1892—Papers read: "Institutions," by J. W. Powell; "The Last Battle of Richard Cœur de Lion," by W. T. Griffin.

191st Regular Meeting, March 15, 1892—Papers read: "Spencer's Theory of Society," by J. W. Powell; "The Rural School Problem," by J. H. Blodgett. Published in *American Anthropologist*, vol. VI (1893), p. 71.

192d Regular Meeting, April 5, 1892—Papers read: "Nomenclature and Teaching of Anthropology," by Dr. D. G. Brinton. The paper was discussed by Major Powell, Dr. Gill, and Dr. Gregory. Published in *American Anthropologist*, vol V (1892), p. 263.

193d Regular Meeting, April 19, 1892—Papers read: "The Modern Apotheosis of Nature," by S. M. Burnett. Published in *American Anthropologist*, vol. V (1892), p. 247. "The Indians of Chihuahua and Sonora," by Mr. F. Bandelier; "The Origin and Migrations of the Blackfeet Indians," by Mr. G. Bird Grinnell. Published in *American Anthropologist*, vol. V (1892), p. 153.

194th Regular Meeting, May 3, 1892—This meeting was held in the Columbian University Lecture Hall, and the Society listened to the annual address of its President, J. C. Welling, on "The Law of Torture: A Study in the Evolution of Law." Published in the *American Anthropologist*, vol. V (1892), p. 193.

195th Regular Meeting, May 17, 1892—Papers read: "Manual Concepts," by F. H. Cushing. Published in *American Anthropologist*, vol. V (1892), p. 289. "The Beneficence of Parsimony," by W. H. Croffut, an extract from a work entitled "The Vanderbilts and the Story of their Fortune." Belford, Clark & Co., New York and London. "Distribution of Ancient Stone Implements

in the Tide-water Country of the Eastern United States," by W. H. Holmes. Published in *American Anthropologist*, vol. VI (1893), p. 1. "Compulsory Education," by W. W. Cheshire; "The Border Land between History and Archæology," by O. T. Mason.

196th Regular Meeting, November 1, 1892—A letter was read from the chairman of the committee of the Folk-Lore Congress of the World's Columbian Exposition inviting members to participate in the congress. The President of the Society gave a brief account of his European trip. Papers read: "Primitive Distillation among the Tarascoes of Mexico," by Captain J. G. Bourke, U. S. A. Published in *American Anthropologist*, vol. VI (1893), p. 65. "The Deadly Microbe and its Destruction," by Dr. Lamb. Published in *American Anthropologist*, vol. VI (1893), p. 15. "The Lines of Civilization," by J. P. Noyes.

197th Regular Meeting, November 15, 1892—Papers read: "Singular Copper Objects from Ancient Mounds in Ohio," by Warren K. Moorehead; "Geographic Nomenclature of the District of Columbia." The chair was instructed to appoint a committee of five to confer with the Commission of Nomenclature of Localities in the District of Columbia.

Special Meeting, November 29, 1892—Papers read: "Genius and Insanity as Forms of Abnormality," by A. MacDonald, to be published in a circular of the Bureau of Education entitled "Social Pathology." Mr. W. H. Holmes gave accounts of "Ancient Jasper Quarries in Pennsylvania," and also of "Ancient Quarrymen of South Mountain."

198th Regular Meeting, December 6, 1892—Papers read: "The Poet; Is he Born, not Made?" by Dr. Robert Fletcher, to be published in the *American Anthropologist*. A report of the Special Committee on Geographic Nomenclature in the District of Columbia was read by its secretary.

Special Meeting, December 13, 1892—The object of this meeting was the hearing of the final report of the committee appointed to consider the Geographical Nomenclature of the District of Columbia. The report is published in full in the *American Anthropologist*, vol. VI (1893), p. 29. A paper was read on the "Principles of Nomenclature," by W. J. McGee.

199th Regular Meeting, December 20, 1892—Papers and addresses were given upon the subject, "Is Simplified Spelling Feasible?" by Prof. F. A. March, Hon. A. R. Spofford, Hon. W. T. Harris, and Hon. E. Willits.

Special Meeting, December 27, 1892—This meeting was to further consider the subject "Is Simplified Spelling Feasible?" Addresses were made by Dr. A. M. Bell, President E. M. Gallaudet, Dr. J. W. Gregory, and Professor Owen.

200th Regular Meeting, January 2, 1893—The subject of the two previous meetings, "Is Simplified Spelling Feasible?" was discussed by L. F. Ward, E. T. Peters, W. Flint, and Major J. W. Powell, the discussion being closed by Hon. A. R. Spofford.

201st Regular and 15th Annual Meeting, January 17, 1893—Reports of the curator and treasurer were read and accepted and a board of audit was appointed by the chair. The following amendment to article XVI of the constitution was adopted: "Gifts and prizes.—The board of managers is authorized to offer prizes for notable original contributions to anthropology." The following officers were elected for the coming year: President, O. T. Mason; vice-presidents, F. A. Seely (Section A); L. F. Ward (Section B); J. W. Powell (Section C); W. H. Holmes (Section D); general secretary, F. H. Cushing; secretary to the board of managers, Weston Flint; treasurer, Perry B. Pierce; curator, F. W. Hodge; councilors, Frank Baker, J. H. Blodgett, D. S. Lamb, W J McGee, George R. Stetson, Thomas Wilson.

MISSION INDIAN MATURITY CEREMONIAL.—In order to prepare young girls for life's duties as they reach the age of puberty, the following custom prevails among the Catholic Mission Indians of southern California, and this after more than a hundred years of mission rule:

As the time for the ceremony draws near, a pit about five feet in diameter and three feet deep is dug in the earth. In this pit is kindled a fire which warms the earth and removes the dampness, causing steam to rise from the brush with which the pit is half filled. The candidates, each wearing a single light garment, now appear and sit upon the edge of the pit. Shortly afterward they lie down upon the brush, side by side, two, three, or four, as the case may be, and are entirely covered with a blanket. While this is being done old women wave branches of sage brush over them, chanting

in a strange, weird manner to drive away evil spirits. This being continued for a time, three or four old women scatter silver coin to the crowd which always gathers to look on and in a measure to participate, as any one is at liberty to secure the coin. This is done to teach generosity.

Before this ceremony commenced at Agua Caliente, the friends of the girls came to the school teacher and presented her nice baskets and laces of native manufacture, at the same time asking her blessing and care for the girls. They next brought to the pit a quantity of calico and gingham, also ten sacks of grain, which were given to the old and needy. These gifts were intended to teach hospitality. Next, quantities of such wild seeds as they use as well as grain were showered broadcast upon the girls in order, presumably, to make them prolific. The next step was to cover the girls entirely with blankets, but curiosity induced them to peep out constantly. Occasionally acorn-meal porridge was given them, and sometimes they were permitted to crawl from the pit for a few moments, wrapped in a sheet or blanket.

While they were entirely covered the whole village joined hands and danced around the pit. After these ceremonies, sometimes as many as ten old women of the village danced around them continually for two to four days and nights, often dancing until they fell from exhaustion, occasionally resting and relieving one another, but always keeping up the dance. A camp-fire was kept burning near by, and an old, barefooted woman danced in the embers. This performance was to teach the girls courage and endurance in suffering.

As the end of the ceremony drew near all strangers were ordered away. The girls then arose, were wrapped in a sheet, and led to their homes with wreaths or garlands of leaves on their heads. Later the garlands were carried to a ravine in a rocky hillside and hung on the bushes or trees about and near a sacred stone on which were showered seeds from the wreaths. After this performance the stone was buried. The ceremony of the ravine, the charm-stone, and the garlands entertain and control the evil spirits which by the other ceremonies have been banished from the girls; nor will they return unless the girls are bad.

HORATIO N. RUST.

South Pasadena, Cal.



THE CITIZENSHIP PRIZES
OF THE
ANTHROPOLOGICAL SOCIETY OF WASHINGTON.

A member of THE ANTHROPOLOGICAL SOCIETY OF WASHINGTON has placed in the hands of the Treasurer of the Society a sum of money to be awarded in prizes for the clearest statements of the elements that go to make up the most useful citizen, regardless of occupation. The donation has been accepted, and the Society has provided for the award of the following prizes during the present year (1893) under the following conditions:

Two prizes will be awarded for the best essays on the subject specified above, viz: A First Prize of \$125 for the best essay, and a Second Prize of \$75 for the second best essay among those found worthy by the Commissioners of Award.

These prizes are open to all residents of the United States.

Essays offered in competition for the prizes shall not exceed 2,000 words in length, and all essays offered shall thereby become the property of THE ANTHROPOLOGICAL SOCIETY OF WASHINGTON, the design being to publish the essays, at the discretion of the Board of

Managers, in the official organ of the Society, the *American Anthropologist*.

Each essay shall bear a pseudonym or number, and shall be accompanied by a sealed envelope bearing the same pseudonym or number, and containing the name and address of the competitor; and the identity of competitors shall not in any way be made known to the Commissioners of Award.

Essays must be type-written or printed, and must be submitted not later than November 1, 1893.

While it is not proposed by the Society to limit the scope of the discussion, and while each essay will be considered on its merits by the Commissioners of Award, it is suggested, in view of the character of the Society and the wishes of the donor of the prize fund, that the treatment be scientific, and that the ideal citizen be considered (1) from the point of view of anthropology in general, including heredity, anthropometry, viability, physical psychology, etc.; (2) from the point of view of personal characteristics and habits, such as care of the body, mental traits, manual skill, sense training and specialization, and all-round manhood; and (3) from the ethical point of view, including humanity, domesticity, charity, prudence, *esprit de corps*, patriotism, etc.

The essays offered in competition for the Citizenship Prizes of THE ANTHROPOLOGICAL SOCIETY OF WASHINGTON will be submitted, on or about November 2, 1893, to five Commissioners of Award, including one anthropologist, one jurist, one statesman, one educator, and one other not yet specified, all of national reputation, of whom at least one and not more than two shall be members of the Society; and the award shall be made in accordance with the findings of these Commissioners.

Essays submitted in competition for the prizes should be delivered not later than November 1, 1893, to the Secretary of the Board of Managers of the Society, Colonel Weston Flint, No. 1101 K street N. W., Washington, D. C., to whom all correspondence relating to the prizes should be addressed.

OTIS T. MASON, *President*.

WESTON FLINT,

Secretary of the Board of Managers.

WASHINGTON, D. C., *March 30, 1893.*

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No. 3.

THE LAST TOWN ELECTION IN POMPEII:

**An Archæological Study of Roman Municipal Politics Based on
Pompeian Wall Inscriptions.**

BY JAMES C. WELLING.

It has now been many years since I traversed the streets of Pompeii and began my study of its wall inscriptions. It chanced that my first visit fell on a day when the laborers engaged in the work of excavation were just laying bare the interior walls of a large mansion in the heart of the town. A French artist stood by my side, with pencil in hand, to transfer to his canvas the fresco (it was a picture of the goddess Flora scattering roses in her train), which had lain buried beneath its ashen shroud for 1,800 years. But as a student of archæology I did not linger long over the wall paintings of a Pompeian interior. Such paintings, at their best estate, belong rather to the category of house decoration than of high art. Hence it is that I have always found myself greatly more interested in the inscriptions traced on the outside of the Pompeian houses than on the formal and conventional work of the journeymen artists who adorned the interiors with frescoes made to order according to the predominant taste of the time.

Since my studies in this direction were first begun a vast addition has been made to the literature of the Pompeian wall inscriptions, in such epigraphical works as those of Orelli, of Garrucci, of Mommsen, and especially of Zangemeister. The collection of the last-named author is almost a complete repository of the materials most essential to the archæological investigator, and such an investigator will be most intelligently guided by a Belgian scholar who has made

this province peculiarly his own, so far as relates to the political significance of the Pompeian wall inscriptions. I refer to a scholarly monograph under this head by M. Willems, a professor in the University of Louvain, who is otherwise known to historical students by his masterly treatise on the "Public Administrative Law of Rome from the origin of the city down to the epoch of Justinian." *

Important archæological "finds" in other parts of what was once the Roman Empire have come besides of late years to throw their cross-light on the electoral methods which were in vogue at the time of Pompeii's overthrow. In the year 1851 two brass tablets were dug up in Spain near the town of Malaga, and on these tablets were found engraved the fragments of a municipal charter granted by the Emperor Domitian to the towns of Salpensa and of Malaca between the years 81 and 84 of the Christian era—a date which makes their enactment almost contemporaneous with the ruin of the Campanian town.† In 1870 and 1874 several tablets containing the organic act granted by Julius Cæsar to the municipality of Urso, now Ossuna, in Spain, were brought to light, and these precious archives have been edited by Berlanga in Spain, by Mommsen in Germany, by Giraud in France, and by others.‡

In the fragments of these several charters the whole theory of Roman municipal government is expounded in detail. From the constitution, for instance, of Malaca we learn how candidates for public place were put in regular nomination; how supplementary candidates could be selected by the presiding judge of elections when a sufficient number of candidates failed to be designated in the regular way by popular initiative; how the elections were conducted; how the ballots were cast and how counted; how the result of elections was to be decided when two or more candidates had an equal number of popular votes in the same *curia* (or ward), or when two or more candidates had carried an equal number of the *curiæ* into which the town was divided for electoral purposes; how the successful aspirants were sworn into office, etc. It may be of interest to state, as illustrating a trait of manners at that time, that where two or more candidates had an equality of votes in Malaca, whether in a single *curia* or in the number of *curiæ* respectively carried by each, the preference was to be given by law to a married man over

* P. Willems : Les Elections Municipales à Pompeii.

† Bruns : Fontes Iuris Romani Antiqui, pp. 136-148.

‡ Bruns : Fontes Iuris Romani Antiqui, pp. 119-136.

a bachelor, to a man who had more children over a man who had comparatively fewer, and, to the end that parentage might lose none of its political privileges, the law further ordained that two deceased children who had lived long enough to be named should be counted as equal to one child still surviving, while sons and daughters who had not deceased till after reaching the age of puberty should be counted on a perfect equality with their surviving brothers and sisters.

The denizen of a town could become *municeps*, a member of the voting population, by free birth, by manumission, by adoption, or by naturalization. The population of a town was divided into Decurions, Augustales, and Plebs, or the populace. The Decurionate of a town comprised its foremost citizens, and, on a small scale, corresponded in relative place and power to the Senate in Rome. This Decurionate was composed of a determinate number of members, generally a hundred, and its members were selected because of their high social positions, their wealth, their public spirit, and especially because of their presumed capacity to bear the public burdens of that day—that is, to dispense largess, furnish gladiatorial games, and adorn the town with public buildings and monuments erected at their expense. It was in no sense a self-perpetuating body. Its members were subject to impeachment for crime or misdemeanor, and if any Decurion was successfully impeached for crime or misdemeanor, the prosecutor who took the brunt of such an accusation was entitled, if otherwise qualified, to step into the shoes of the dignitary whom he had evicted. A public list of Decurions was always kept on exhibition in the *Album* or White List of the town. This list was posted in the Forum, and was revised every five years by the *Duoviri* (or *Quatuorviri*)—that is, by the chosen Selectmen of the town. The duty of Selectmen in a Roman town corresponded to that of burgomasters in an old Dutch town. The Decurionate was kept full by appointments which the Selectmen made from time to time when vacancies were created by death. To be eligible as a Decurion a citizen had to be twenty-five years old and to possess property worth at least 100,000 sesterces.

The Augustales were a corporation appointed originally by Augustus from among the rich freedmen, to occupy a place intermediate between the Decurions and the populace. It was their titular duty to watch over the Lares, whose images the Emperor set up in the cross-roads. The body came in the end to be composed of

rich fools who were willing to pay for costly public sacrifices, sumptuous public entertainments, and large popular assemblies.

The ordinary magistrates of a Roman municipality, at the beginning of the Christian era, were two Selectmen, called *Duoviri juri dicundo* (there were sometimes four of them, called *Quatuorviri juri dicundo*), who presided over the town and administered justice; two Overseers of roads, markets, etc., called *Ædiles*, who superintended the public markets, inspected the weights and measures of tradesmen, kept the roads in repair, and distributed provisions to the needy; and sometimes there was a *Quæstor* who took special charge of the public chest and of the public disbursements, when this duty was not distributed among the *Duoviri* or *Ædiles*.*

City officials were elected every year, generally in the month of March, because the fiscal year was closed on the last of June, and newly elected officers entered on their functions on the first of July. The politics of Rome and her municipalities had not yet reached the stage of the "nominating convention." All candidates were put in nomination by the spontaneous acclamation of their friends. The modest but acquiescent phrase of a modern politician that he "is in the hands of his friends" had its full and literal significance in a Roman town. Anybody—man, woman, or child—could make nominations and post them on any wall space which he or she owned or the use of which he or she was willing to hire for advertising purposes. The nominator wrote out the name of his favorite, the office for which this favorite was designated, and then begged the people to support his recommendation. Sometimes he put his signature to the appeal, and sometimes he blazoned the name of a budding politician at the street corner without putting any sign-manual to the electioneering manifesto. Sometimes the mere initials of a popular name were deemed enough. Municipal statesmen dragged to light in this spontaneous way, though each was doubtless in his own eyes "the rose and expectancy of the fair State," were wary against the risks of candidature when there was no prospect of an election. They waited till they could see how the cat was likely to jump. If their prospect of election seemed good they went to the senior of the Selectmen, who was *ex officio* president of the election, and avowed themselves as candidates for the post in connection with which they had been named. This open avowal of a willing-

* There was no *Quæstor* in Pompeii after the Roman colony displaced the old Oscan natives.

ness to stand was called a *professio*, and from that moment a candidate's name was placed on the town "White List" and exposed to the gaze of all the townsmen in the most frequented part of the Forum.

Elections in Pompeii and elsewhere were not made by a gregarious vote of all the people. Every town was divided into *curiæ*, or electoral precincts, and the successful candidate was he who secured a majority of the precincts, whatever might be his strength or weakness as measured by the total popular vote. Nobody could pose as a candidate till after he had been enrolled on the White List, and every voter was limited in his choice of candidates to the names published in that list.

All the *curiæ* of a town were summoned to an election by a simultaneous call addressed to the voters in each. On election day the voters assembled by *curiæ* in the Forum around the election booth—an enclosure marked off by ropes or by palisades (*tabulata*) or by bars (*cancelli*). The presiding magistrate then read out the names of the candidates to be voted for from the list which had been posted on the public Album three market days before. The voters next received the tablets on which to write the names of the candidates, and at a given signal formed in line, *curia* by *curia*, as each was selected by lot, and, proceeding by a narrow raised walk (made of boards and called the *pons* or *ponticulus*),* they entered man by man into the voting pen, and as they entered dropped their ballot into the ballot-box.† This ballot-box was watched by three public inspectors, called *rogatores*. Besides these public inspectors it was competent for each candidate to station an inspector of his own choosing at the ballot-box to guard against frauds to his disadvantage. All inspectors, as well those of private as those of public appointment, were sworn to keep and return in good faith a correct tally of the votes.

With these preliminaries we are now prepared to understand the political statistics of Pompeii on the occasion of its last municipal election. Pompeii, as everybody knows, was overwhelmed by an

* Hence the origin of the Roman proverb, "Put men of sixty off the bridge" (*Sexagenarios de ponte*), used to signify that any old man might be "lingering superfluous on the stage." At the age of sixty men were exempt from public service.

† For a lively account of election riots at Rome, see Cicero: Epist. ad Atticum, iv, 3. How ballots were "fixed," see Epist. ad Atticum, i, 14.

eruption of Mount Vesuvius on the 23d and 24th of August, in the year A. D. 79. Her two Selectmen and her two Ædiles were therefore elected in the preceding month of March and had entered on their functions on the 1st of July. Within the already excavated part of the town the signs of that last municipal contest meet us on every hand in the shape of political manifestoes painted in red, scrawled in crayon, or cut with the stylus on the surface of a thousand walls. From the large number of these inscriptions already recovered it is plain that nearly two thousand of such proclamations must have been posted in the whole town. Some of these, however, are evidently the vestiges of electoral contests in former years. The great majority of them reveal the Roman electioneering process in the first stage of its manifestation, to wit, in the spontaneous nomination of candidates. The first suggestion of a new candidate was put forward as a "feeler," and, as has been just stated, proceeded from the neighbors, friends, or clients of any putative aspirant. This suggestion was made in the terms of a consecrated formula, and, to cite one example among a thousand, ran as follows: "Phœbus, with his customers, desires M. Holconius Priscus and Caius Gavius Rufus as Duoviri." "Parthope, with Rufinus, desires Helvius Sabinus as Ædile." As a result of the spontaneous nominations made in the year 79 we know that only ten men, out of the hundred or more who received a fillip of some kind, were willing to stand the risks of the electoral ordeal. For the office of Duumvirate four citizens made a public *professio*. We know their names, their residences, and in some cases the quality of their supporters. Their names were Marcus Holconius Priscus, otherwise known to have been one of the most opulent citizens of Pompeii; Lucius Ceius Secundus, Caius Gavius Rufus, residing in the northern part of the town, and Caius Calventius Sittius Magnus. For the office of Ædile six candidates put themselves in evidence: M. Casellius Marcellus, M. Cerrinius Vatia, L. Popidius Secundus, C. Cuspius Pansa, Cn. Helvius Sabinus, and L. Albucius Celsus.

After the names of these candidates had been posted on the municipal bulletin-board—I should say the bulletin wall-space—it will be readily understood that there was a variation in the mode of popular appeal. As voters in their selection of candidates were confined to names on the official list, we observe that all the electioneering appeals after a certain date call for votes in behalf of some particular candidate or candidates. A single example will

suffice to illustrate the changed formula: "We beg you to vote for Caius Gavius Rufus and Lucius Ceius Secundus as Selectmen." "We beg you to vote for M. Casellius Marcellus and L. Albucius Celsus as *Ædiles*.*

Labor leagues, guilds, sodalities, political clubs, and religious associations had been of ancient date in Pompeii. All such voluntary organizations, as we learn from Tacitus,† were suppressed at one time because of the riots to which their rivalries had led, but they soon reëstablished themselves, and their active intervention in this last town election may be read on every wall. Labor leagues were factors in politics, because every league had its patron, selected from among the rich inhabitants of the town, and the patron looked to his league for its organic support at the nominating period and on election days—that is, the leagues were political machines whose working gear was lubricated by the rich man's sesterces. Local and religious unions also took an active part in Pompeian politics.

Among the Labor Leagues which bore a hand in the municipal campaign of A. D. 79 were those of the "Goldsmiths," the "Workers in Wood," the "Wheelwrights," the "Fruiterers," the "Miller-Bakers," the "Pastry Cooks," the "Poulterers," the "Dyers," the "Barbers," the "Muleteers," the "Perfumers," the "Fishmongers," and, of course, the "Tavern-keepers." Among clubs we find the names of the "Ball-jugglers" (*Pilicrepi*), of the "Farmers," of the "Late Topers" (*Seribibi*), of the "Sleepy-heads" (*Dormientes*), and of the "Little Thieves" (*Furunculi*), the last three being facetious names of which the origin is as obscure to us as the origin of our "Hunkers" and "Barn-burners" will probably be to the archæological student of American political nomenclature in the year 4000 of our era. The club of the "Late Topers" had their headquarters at the tavern of one Edone (the Latinized spelling of her name indicates that she was a Greek), situate between No. 10 and No. 11 in the street of the *Augustales*,

*The ordinary formula, written out in full, is "*oro vos faciatis*," or "*oramus vos faciatis*." Sometimes it is abbreviated into "*O. V. F.*," and sometimes into "*OF*." In the nominating stage of these inscriptions the word *cupit* is used interchangeably with *rogat*, and in the voting stage the writer sometimes gives emphasis to his suffrage by declaring that he votes for his favorite "with pleasure," "with eagerness," or with "very great eagerness"—(*gaudens facit, cupidus facit, cupidissimus facit*).

† Tacitus: *Annalium*, Lib. xiv, 17. Cf. Suetonius: *Julius Cæsar*, § 42.

leading to the Forum. An inscription on the outside of the inn announces that the Late Toppers, in a body, solicit the suffrages of the people for M. Cerrinius Vatia as *Ædile*. (M. Cerrinius Vatiā *Æd.* O. V. F. Seribibi *Universi rogant. Scr. Florus cum Fructo*). Two doors further on the "Little Thieves" publish their adhesion to Vatia in like manner (Vatiā *Æd.* *Furunculi rog.*), and at the next entrance the "Sleepy-heads" call, as they say, with entire unanimity for the nomination of the same "favorite son" of Pompeii.

It must be confessed in my veracious chronicle of the last town election in Pompeii that the aforesaid M. Cerrinius Vatia had the bad fortune to be supported by all the self-styled Tapsters, Sluggards, and Jeremy Diddlers of the town. As Vatia was also patronized by the men of brawn combined in the Labor Union of the burly "Street Porters," and appears to have been a favorite with the coarse Oscan folk comprised in what was known as the "Campanian ward" of Pompeii, it is to be feared that he must be classified as a "sporting character," as a "stalwart," or even as a "tough." It is very certain, from the quality of his supporters, that his virtues could not have leaned to the side of too much asceticism.

We learn from the wall inscriptions that two of the guilds or sodalities which participated in this last town election were formed under the auspices of religion—that is, of such religion as passed current in Pompeii at that date. They were formed respectively by the votaries of Isis and the votaries of the Physical Venus. Isis, the Egyptian goddess, whose worship was suppressed again and again at Rome by consuls and emperors because of the licentious orgies connected with her mysteries, had a temple and a strong following in Pompeii. Indeed, she divided with Venus the religious cult of the town, and we may picture to our fancy the roystering crew of her devotees as, on election day, they marched to the polls with their dog-faced masks on their faces.* The Isis cult united on Cuspius Pansa and Helvius Sabinus for the *Ædileship*. But the Physical Venus—not the Heavenly Venus, be it observed, but the

* Isis was so popular in Pompeii that when her temple had at one time been destroyed by an earthquake, probably by the earthquake of A. D. 63, and when Numerius Popidius Celsinus had caused it to be rebuilt from its foundation at his own expense, the Decurions annexed him to their order at once, though at the time he was only six years old. Orelli, vol. ii, p. 165.

"*Venus fisica Pompeiana*," as she is described on these walls—was the patron goddess of this voluptuous town. Her votaries announced that in this election they would support Ceius Secundus as Duumvir and Popidius Secundus as Ædile. In what is to-day called the street of the Soprastanti, not far from the Forum, we may remark on the wall of a shop the following inscription, appropriately placed under a picture of Bacchus: "Venus goes for Casellius as Ædile." We see that Bacchus and Venus were married in Pompeian politics as well as in the old mythology of the time. Isis had her party and Venus had her party, but Pudicitia, the goddess of Chastity, appears to have had none. There is certainly no trace on these walls of any "Sodality for the preservation of Chastity" (*Sodalitas Pudicitiae Servandæ*) as we know there once was in Rome.*

The preparation of wall surfaces for the reception of inscriptions, and the writing of political advertisements upon them, was evidently a thriving branch of business in Pompeii. We know the names of the men employed in each of these callings. They were the job printers and bill-posters of the time. Among the wall-surface preparators one Onesimus and one Victor seem to have been conspicuous. Among wall-writers, Issus and Secundus and Fructus and Papilio and Protogenes and Infantio have been careful to hand down their names to us by appending them at the bottom of the political announcements of which they were the paid inscribers. Infantio at one time had evidently made a "corner" in the advertising business, for he writes that he had associated with him in his trade, "here and everywhere," a trio of partners—Florus, Faustus, and Sabinus—the first case on record, so far as I know, of a "trust" in bill-posting! Sometimes a thrifty citizen of Pompeii, whose house was well situated for the purpose, would rent out the whole broadside of his habitation for the reception of public advertisements. A case in point is that of the popular baker, Titus Genialis Infantio (was he a relative of Infantio the bill-poster?), who sold bread and cakes on the southeast corner of a square not far from the middle of the via Nola. His house suffers to this day almost as much from the pock-marks of the political advertiser as from the volcanic peltings of Vesuvius. It is speckled with what Willems calls a veritable motley of electioneering cries. It ought, perhaps, to be mentioned

* Orelli, vol. i, p. 418.

that Mr. Cerrinius Vatia, our candidate with the scurvy following, appears to have employed careful scribes to indite his name where it could be best seen by an admiring public. Popidius Secundus, on the other hand, engaged mere scribblers, who were careless even in their spelling. It is evident that he was not a "liter'y fellow."

We have said that the *curia* or *tribus* was the electoral unit of a town. The number of these *curiæ* depended on the size of the town and the extent of its voting population. There were probably six wards in Pompeii, and from the electoral announcements we can conjecture the names of at least three of them: the ward of the "Forum," comprising the squares in its vicinity; the ward of the "Campanians," in the northeastern part of the town, where the old Oscan folk had their habitations; and the ward of the "Salt Yards," lying along the suburbs in the direction of Herculaneum. On the wall of a house in Crooked street (*Vico Storto*, as the Italians to-day call it) we find this inscription, "Hurrah for the Salt Yarders!" (*Saliniensibus feliciter!*) We may fancy that this exultant inscription was put up after the "Salt Yarders" had gloriously carried their ward for their favorite candidates, and had thus saved Pompeii, as they fondly hoped, for at least one year, when Vesuvius came in the twinkling of an eye to put an end to low ambition and the pride even of Duoviri, in this public-spirited municipality where, as Cicero tells us, it was harder to become a Decurion than to become a Senator in Rome.*

As Pompeians voted by electoral precincts and not by a general vote of all the inhabitants, it is easy to see that this arrangement lent itself to "trades" and "combines" between candidates and their adherents in the several wards. The aim of each candidate was to secure a majority of the *curiæ*, however far he might lag behind in the popular vote. Hence the temptation to sell votes where they were not wanted for votes where they could do the most good—to wit, in evenly divided *curiæ*. The evidences of such

* See the story in Macrobius, where, however, the point of the pleasantry is not so much the difficulty of becoming a Decurion in Pompeii as the facility with which one could become a Senator in Rome—by the favor of Julius Cæsar. "Cicero facilitatem Cæsaris in adlegendo Senatu inrisit palam. Nam cum ab hospite suo, C. Mallio, rogaretur ut Decurionatum privigno ejus expediret, adsistente frequentia, dixit: 'Romæ, si vis, habebit; Pompeiis difficile est.'" *Conviv. Saturnal., Lib. vii.*

"trades" and "deals" are abundant.* For instance, on the house wall of Rufinus, a man of good family in Pompeii, but who evidently had a municipal bee buzzing in his bonnet, we read this inscription, put there by some fugleman for L. Popidius Secundus: "Rufinus, we beg you to vote for Popidius Secundus as Ædile. He is an excellent young man and worthy of the commonwealth. Favor him and he will vote for you." [Popidium Secundum Æd. D. R. P., Probissimum Juvenem, O. V. F., Rufine, fave et ille te faciet.] On another wall we read: "Proculus, vote for Sabinus as Ædile, and he will vote for you." This Proculus was evidently a political "worker" and had a "machine." At a previous election we find this appeal to him: "Proculus, put in your full work (*officium commoda*) for your man Fronto." An order from one of our own municipal "machines" could hardly improve on such a choice bit of practical politics. Sometimes these appeals are of the whining or supplicatory kind, such as that addressed to one Diadumenus at a former election. Somebody has written on his house: "O Diadumenus, I know that you are going to vote for Lucretius as Ædile." Sometimes a gleam of humor shines through these wall inscriptions, as when Sabinus, who describes himself as "usher" in the town theatre, and who therefore was used to the sound of applauding audiences, declares that he "votes" for M. Popidius Sabinus as Duumvir "with applause" (*cum plausu*).

It is some consolation to find that these "trades" were concerted between the friends of candidates for the Ædileship and not of candidates for the office of Duumvir, which latter had judicial duties attached to it. Willems notes that among all these electioneering appeals there is not one emanating from a Duumvir in office at that time. These dignitaries appear to have abstained from all "pernicious activity" at least in the last town election held in Pompeii; and yet there was no Civil Service Commission in Pompeii to keep them in order. Where there was political cheating we may be sure there was much of crimination and recrimination. The fidelity of clansmen and of "heelers" was often called in doubt. For instance, on the wall of a house situate on the street which leads to Stabia, and which was a popular thoroughfare, some "heeler" of

* Such "trades" or "deals" were so common in Roman cities that in the political vocabulary of the time there was a technical name for the process of making them. It was called, "Coire ad deiciendum alium honore."

Caius Calventius Sittius, who, we remember, was "running" for the office of Duumvir, has addressed the following significant admonition to a political confederate by the name of Ubonius: "Ubonius, be on your guard!"—"Keep your eye skinned," as we would say in modern parlance. This "heeler," I regret to say, like some of his congeners at the present day, was stronger in the art of voting a straight ticket than in the art of Latin orthography, for his spelling of "vigila" (which he spells "vigula") would have made Quintilian gasp. On another wall we find some political friend of L. Popidius Secundus, whose name has met us before in these unsavory associations, pouring sarcasm on a fellow-worker who was, it seems, not sufficiently wide awake to the then pending "crisis" in Pompeian politics. He writes: "O Infans, you are asleep, and you are electioneering!" Besides these, one Attalus and one Magius are stigmatized on the walls of Pompeii as politicians who deserved the curse of Meroz, and who were "sleeping" on the parapets of the citadel when they should have been alert to foil the knavish tricks of the adversary.

The word "Mugwump" is said to be of Algonquian origin, but eighteen hundred years before our learned colleague, Mr. J. C. Pilling, had published his "Bibliography of Algonquian Languages" it would seem that Pompeii had her Mugwumps, of somewhat easy virtue, who satisfied themselves with making wry faces in public when they swallowed an unsavory candidate. At any rate, we have a wall inscription written by a man who gave only a squeamish support to M. Cerrinius Vatia, the same dubious worthy who rejoiced in the patronage of the "Late Topers," of the "Sleepy Heads," and of the "Little Thieves." The inscription reads as follows: "M. Cerrinius for Ædile. One man has his likes; another man is liked. I am squeamish. The man who is squeamish has his likes."* The language is slightly enigmatical, but the meaning is clear. The writer means to say that though he has what we should call to-day "Mugwumpian proclivities," he yet has a liking for Cerrinius and intends to vote for him without asking too nice questions for conscience sake. Perfectly frank, outspoken, and

* In the compact Latin it is phrased and spaced as follows:

M. Cerrinium,
Æd. Alter amat; alter
Amatur. Ego fastidio.
Qui fastidit, amat.

thorough-going, however, is the political enthusiasm of other partisans, who evidently prided themselves on voting the "regular ticket"—such as that of the henchman who appeared to have supported one Quintus in some former election. He writes: "The man who refuses to vote for Quintus ought to be mounted on an ass."

The tavern and the eating-saloon were a political power in Pompeii. Most of the women who took a hand in Pompeian politics were, I regret to say, members of the "Tavern-keepers' Union" in Pompeii. There was such an Union in Pompeii, as abundantly appears from the electioneering manifestoes. The names of Pollia, of Statia, of Petronia, of Helpis Afra, of Recepta, and others attached to these electoral broadsides, are significant at once of the humble origin and of the disreputable profession of their bearers. Sometimes they are associated with their husbands in this political "tooting," and in at least two cases the gray mare seems to have been the better horse, for the woman puts her name before that of her husband:* "*Recepta, nec sine Thalamo*," is the quiet way in which one of these political landladies tucks away her husband under her apron-string in announcing their joint nominations.

That primary meetings and caucuses were sometimes held in tavern halls we know from this tell-tale inscription on the wall of a hostelry: "Landlord Seius, you did well in accommodating us with seats." It is evident that the caucus had been a little larger than usual on some night during the electoral canvass; that Landlord Seius had risen to the height of a great emergency, and had determined that the meeting of his crapulous political customers should

* It has sometimes been suspected that women voted in Pompeii, because there are two or three wall inscriptions which may seem to have such an implication; but the statement is doubted by Willems on what seems good grounds. In such phrases as "Little Sprite votes for Claudius as Duumvir" (*Claudium iiv. Animula facit*) we may much better suspect a pleasantry than a cold historical fact; just as when we read on another wall that "Venus goes for Casellius as Ædile" we do not take the statement literally. Such pleasantries are common enough in Cicero's Letters, where Marc Antony figures as "the Trojan Lady." And then, if women voted in Pompeii, what are we to do with the express statement of Aulus Gellius, who wrote about this time, when he says that "between women and elections there is no communion"? The passage may be found in the seventh book of his "Attic Nights," and seems to have been strangely overlooked by the critics.

not be broken up for want of sitting accommodations! If the "Loco-Foco match," suddenly improvised on a certain occasion to relight Tammany Hall, was sufficient to give its name for years to a great party in the United States, who shall say that the provident thoughtfulness of Landlord Seius might not well excite the admiration of a Pompeian "heeler"? How far off seems the sound of these ancient tosspots, as they jabber municipal politics over their cups of sour wine, and yet how near it is to us all, as we recall the publications of our own "Municipal Reform Leagues"!

Paullo majora canamus. Let us turn from these surface indications and these minute curiosities of Pompeian politics to the deeper moral of our archæological study. We catch here the institutes of Roman municipal government in the transition epoch. Republican liberty was dead in the city of Rome, but the simulacrum of popular suffrage was allowed to survive for a time in the remoter municipalities. The servile collar was fastened on the neck of the Roman people, but the collar was gilded. The rude *ovilia* into which the tribes had flocked on the Campus Martius were converted into marble colonnades large enough to afford standing room to the whole voting population of Rome. Cicero tells us in one of his letters to Atticus that even in his days they were proposing to erect marble halls a mile long for political gatherings.* The halls were built and dedicated by Augustus, but with the accession of Tiberius the farce of popular elections was ended. All elections were transferred from the Campus Martius to the Senate. Municipal autonomy was abolished. Rome had purchased civil security at the price of political privilege, and was content with her bargain. Most interesting would it be to trace the successive stages of this great social and political transformation, for it was social before it was political, and it is in the later stages of this transformation that the seeds of the European feudal system were sown. The common people were cut and carved by the swords of their masters into artificial working gangs, and were planted on separate parcels of land under an arbitrary tie of allegiance. The unit of government passed from the clan with its tie of common blood to the feud with its tie of common land.

If the land law of England still welters in the dregs of feudalism (*in face feodorum*), as Sir Henry Sumner Maine declares, it is cer-

* Cicero: Epist. ad Atticum, iv, 16.

tain that the land law of the feud drew its origin from the corruption of the blood-tie, as a bond of government, in the last dregs of Romulus (*in facie Romuli*), as Cicero phrased it. In the redistribution of social elements in this period of change, a separate and distinct stratification of social layers was being slowly effected throughout the whole Roman Empire. The upper classes were differentiated into finical strata based on mere distinctions of rank, the aristocracy of place and function, and no longer the aristocracy of character and service. What with titular rights of precedence among the *Nobilissimi*, the *Illustres*, the *Spectabiles*, the *Clarissimi*, the *Perfectissimi*, and the *Egregii*, the lines of social demarcation were arbitrarily drawn, because they were purely artificial in their institution. The public offices were gradually converted from posts of public trust into the seats of a centralizing despotism, which called for posture-masters of servility rather than for self-respecting rulers. The office of Decurion from being sought because of its honorable insignia and its social privileges came to be loathed and shunned for its intolerable burdens. Rich men hid themselves from publicity, and, like the martyrs they were, they wandered in deserts and in mountains and in dens and caves of the earth to escape the pains and penalties of office. They married slaves to work corruption of blood in order to disqualify themselves for public honors. They enlisted as common soldiers, preferring the horrors of war to the terrors of office. The only door of hope which opened to them a way of escape from this valley of Achor was to be the father of twelve children. The law of the Empire graciously assumed that the father of twelve children had done service enough to the State without being called to make further contributions, and that he was likely to have cumber enough at home without bending his back to bear the burdens of the commonwealth. And as every benedict could not hope that his wife would prove such a fruitful vine by the sides of his house as to be the mother of twelve children, rich men at length sullenly forswore matrimony on the plea that they were tired of gendering servants who should be at the behests of an insatiate and blood-thirsty populace, which never wearied in its cry for bread and gladiatorial games.*

In like manner the Labor Unions, from being self-protecting leagues which aimed to stimulate a wholesome emulation among

* *Corpus Iuris Civilis*: Novella xxxviii.

their membership, were ultimately converted into so many bands of hereditary bondsmen, tied to the trades in which they were born as serfs were tied to the soil on which they were born. The unions themselves were crushed under the iron wheel of imperial law.* It became a rule of law that a labor union could claim its run-away members as the curials of a town could claim their run-away officials. Theodosius launched his thunderbolt at the members of labor leagues who deserted handicraft service in the cities and betook themselves into the waste places of the earth. He proclaimed that all such shirks should be recovered from the solitudes into which they had fled, and should be bound afresh to the thralldom of their task-masters. There was no exit from the *status* of the laborer. The laboring masses were reduced to a common level of degradation, with no vicissitude except that determined by distinction of labor castes. The feudal system was in full process of formation.

We see how true it is that the loss of freedom and of individual initiative brings with it the loss of all other boons. "Sow liberty in a lagoon," says Serrigny, "as at Venice, in her origin; in a fen, as in Holland; in a little island, as in England, and there will spring from it a nation great and glorious. . . . Give to despots the whole earth, as the empire of Rome, the capital city of the world, was given to the Cæsars (or, rather, as it was snatched by them), and they will raise great armies, will build magnificent structures and monuments, will create grand and beautiful highways, will organize an administration regular, uniform, and highly centralized, the instrument of domination; will achieve, if needs be, the conquest of the world. All this will produce for the inhabitants of that nation only ruin, misery, confiscation, desolation, and from all this there will emanate in the end only a putrid corpse, ready to be trampled under foot by barbarians." †

* Digest : xlviii, 22.

† Serrigny : *Droit Public et Administratif Romain*. Vol. ii, p. 448.

ARE THE MAYA HIEROGLYPHS PHONETIC?

BY CYRUS THOMAS.

The character of the writing found in the Maya codices and inscriptions has been, in the last few years, the subject of considerable discussion among the few scholars who are devoting attention to these aboriginal records; but the conclusions reached are widely different, some—as Drs. Förstemann, Schellhas, Seler, and Valentini—maintaining that the characters are ideographic and not phonetic, while others—as H. de Charencey, Leon de Rosny, and the present writer—believe them to be chiefly phonetic. Dr. Brinton takes a somewhat middle ground, holding that this script is in the nature of rebus-writing, which he terms “ikonomatic.” If the interpretations here presented be accepted in whole or even in part, the question of phoneticism is settled.

There are reasons besides the direct test of decipherment for believing the writing to be, in part at least, phonetic. We have the positive statements of early Spanish writers to this effect, Landa supporting his assertion by giving what he declares are some of the letter elements of the glyphs and a full series of the day and month symbols. As the latter have been verified throughout by the codices and to some extent by the inscriptions, it would seem improbable that he was wholly in error in regard to the character of the writing. It appears, further, from a statement by Father Alonzo Ponce, quoted by Dr. Brinton,* that the missionaries learned to read and write them, and probably used them to impart instruction to the natives. A translation of his language is as follows:

They are noteworthy for three things among all those of New Spain: one, that in ancient times they had characters and letters with which were written their history and the ceremonies and order of the sacrifices to their idols, and their calendar, in books made of the bark of a certain tree, which were long strips a quarter or a third as wide, which were doubled and folded, and thus assumed somewhat the form of a book bound in quarto. These letters and characters were not understood save by the priests of the idols (called in that language *ahkines*) and some Indians of high position. In later times some of our priests understood and knew how to read them and also to write them.

* Maya Chronicles, p. 63.

The natural inference to be drawn from this language is that these characters were something more than mere conventional symbols.

The remarkably correct description of these codices given by Father Ponce, who had traveled in Mexico and was acquainted with the Aztec picture-writing, warrants us in assuming that he was correctly informed as to their character by the priests who had studied them; and, if so, there is little, if any, doubt that he understood them to be phonetic.

The failure hitherto to apply Landa's letter elements in the solution of the problem is not conclusive proof that they are wholly erroneous. Numerous reasons for such failure besides that of misconception or willful misrepresentation on the part of the old bishop may be given. One cause of failure to obtain favorable results has been the neglect of those attempting to use the alphabet to take into consideration the bishop's lack of artistic skill in drawing the characters. This neglect has perhaps been a more serious drawback than has been supposed. Take for example his second *l*, which, as it stands in his manuscript, will not be recognized in the codices, but if turned half-way round is seen to be a rough attempt to draw the symbol of the day *Ahau*, which forms the upper half of the symbol for *Likin*, "East." When thus correctly understood it begins to drop into place according to its given phonetic value. So with his second *x*, which, if the position is changed, will be recognized as a rude imitation of the upper part of the symbol for *Chikin*, "West," the same as the symbol for the day *Manik*. Here again the phonetic value is retained in the combination.

Another reason why efforts at decipherment have failed of success is the misconception of the peculiar character of the writing which Dr. Brinton, with clearer conception, evidently attempts to explain by his theory of "rebus-writing." This peculiarity is found in the fact that as it exists in the codices and inscriptions it is in a transition stage from the purely ideographic to the phonetic. I think, however, he has failed to give a complete explanation in neglecting to note the range in variety, and especially the nearer approach in part made to true sound writing. As it is not supposable that there was a sudden leap from the symbolic to the phonetic, it is presumable that the symbols would, so far as possible, be gradually given phonetic significance, in which process they would pass through the stage this author has aptly named "ikonomatic." Had the Maya scribes at the time of the Conquest advanced beyond this stage?

I think they had, though it is not contended that the transition was completed, but in process. If this opinion be correct, we may expect to find an intermingling of conventional symbols and phonetic characters; but it is not supposable that the latter had reached that stage where each sound was indicated by a glyph or sign; nor is this method of forming a written language peculiar, as the derivation of the cuneiform or "wedge-shaped" writing from picture-writing has been traced through the archaic forms of the earlier Babylonian texts. "Like Egyptian hieroglyphics, the system included both the use of symbols standing for syllables, and also of the older ideographs or sketches of the object, used as determinatives to secure the right understanding of the combined syllables."*

"Both cuneiform and hieroglyph trace their origin to picture-writing. The two systems developed independently five hundred characters: phonetic, ideographic, and determinative."†

It is therefore to be expected that examples of each of these stages of development will be found in the Maya writing. In fact, it is probable that the same character may be found in one place as phonetic and in another as retaining its symbolic significance. As an example, the symbol for the day *Kan* appears in many places to be used as a mere symbol for maize or the grain of maize; yet it is found in numerous combinations and relations where it cannot be considered a symbol with its usual meaning, but may be consistently rendered if considered phonetic. The same may be said of other symbols. If the writing be in any true sense phonetic, we may expect to find here, as in the primary stage of other written languages, several different signs for the same sound, which we find is true even in Landa's short and partial list.

The indications, so far as revealed by the study of the writings, are that, as a general rule, the consonant sounds are those represented by the characters; not that these glyphs are limited to these consonant elements, for this is seldom if ever true; but it appears that a character was selected to represent a certain sound or syllable because as a conventional symbol it was used to denote a word having a given consonant as its chief phonetic element.

Thus, for words or syllables in which *b* is the chief consonant sound, they made use of the conventional symbol for "footstep,"

* Conder, "Syrian Stone-lore," p. 15.

† Ibid., p. 64.

"path," "road," because in their language *be* or *beil* expresses the meaning of this symbol, which is a circle with five inclosed dots (Pl. I, 2), the conventionalized form of the footprint. The subordinate elements, chiefly the vowel sounds, are often left to be supplied from the connection, or are indicated by certain marks or determinatives, though as yet but few of the latter have been ascertained. It is found, however, that the leading phonetic element indicated by the glyph is not always the initial sound of the word where this is a vowel. That some of the glyphs are genuine syllabic characters is also true. Thus the symbol shown in Pl. I, 8 (omitting the prefix) appears to have in most cases *cab* as its phonetic equivalent.

It is apparent to careful students that all the codices are formed substantially upon the same conventional plan, the widest variation being found in the Codex Peresianus. As a general rule, the pages are divided by cross-lines into two, three, or four divisions, and these are arranged into sections or chapters. Often a section extends partially or wholly across a single page; sometimes it continues to or over the next page or the two or three following pages. There is usually placed at the left of these sections or series one or more columns of day symbols, over which are the numerals to be attached to them according to the Maya system of numbering days. From these, running along to the right, usually immediately below the text, is a series of black and red numerals indicating certain days, as explained in my "Aids to the Study of the Maya Codices."* The text is usually arranged in groups of four or six compound characters over a pair of numerals—one red, which gives the day number, and the other black, which forms the counter or denotes the interval. It is apparent from this arrangement that the text refers in some way to the dates indicated by the numerals, and this leads to the reasonable conclusion that these records are to a large extent only religious calendars; but, as the Mayas carried their religion into all their actions, we have in these codices allusions to most of their customs and industries. We must expect then to find here brief formulas, directions to be observed, and possibly notices of good and evil days on which to do certain work or perform certain acts.

This conclusion in regard to the subject-matter of the text is reached independently of the decipherment of the characters, by a

*6th Ann. Rep. Bur. Eth., pp. 275-283.

study of the accompanying figures, the fact that time symbols are connected with each group, that there is often a repetition of characters in related groups, and that there is often a certain parallelism in the groups of a series so marked that the general subject of the series may be ascertained if but one or two characters are deciphered. Even without this it is often possible to decide what certain characters of the series refer to.

I have decided to occupy the space allowed me chiefly with examples of my interpretation of single compound characters in order to afford investigators a basis on which to work in testing my conclusions or in making further advance.*

Taking as a starting point Landa's second *b*, which has already been referred to, we will proceed step by step, basing what follows on that which precedes; not, however, without an occasional break in the chain. This *b* character, as given by Landa (Pl. I, 1), is a circle with four inclosed circular dots; in the codices it is always found with five interior dots, as Pl. I, 2; the four outer ones are sometimes placed against the surrounding circle, which is frequently double (Pl. I, 7). So far as ascertained, these differences in form do not appear to have any bearing on the phonetic value; possibly, however, it may yet be discovered that they serve to indicate the vowel elements.

In the lower line of Dres. 46c is the character shown in I, 3; also that shown in I, 4, each (omitting the numeral) used here as the symbol for the month *Kayab*. Although differing materially from Landa's symbol for the same month, which is not found in the codices, there can be no mistake as to their significance here, as is shown by tracing the series running through pages 46-50. Here, then, is one instance in which the *b* character appears where the word indicated has *b* as one of its leading consonant sounds. The right appendage to Pl. I, 4, which appears to have *u* as its chief phonetic element or equivalent, is probably used here as a month sign or determinative.

*The following abbreviations are used to economize space: Dres. = Dresden codex; Tro. = Codex Troano; Cort. = Cortesian codex. The numbers which follow these abbreviations indicate the page or plate of the codex mentioned. The small letter following a number—thus: Dres. 45b—denotes the transverse division of the page, the top one being indicated by *a*, the second by *b*, etc.; hence the example given is to be read Dresden codex, plate 45, second division.

Landa's symbol for the month *Pop* (Pl. I, 5) has the *b* character as its chief element, indicating, if the name given be correct, a substitution of *b* for *p*. That this supposition is correct appears to be confirmed by the fact that the symbol for the same month, as found in Dres. 50b (Pl. I, 6), has, in place thereof, a quite different character, which we may safely assume has *p* or *pp* as its chief element. This change in the symbol used for a given month seems to furnish a strong indication of phoneticism. The circular prefixes in the latter, as also seen in I, 11, do not appear to be a part of the symbol; they may, as Dr. Seler suggests, denote twenty or, more likely, show that the month is complete. At any rate, they are only used with month symbols where the month is complete or follows one completed.*

In Tro. 3*b are the two characters shown in Pl. I, 7, 8. The left part of I, 7, is the same as the upper part of the symbol for the months *Yax* (I, 10, 11) and *Yaxkin* (I, 12) as given by Landa and as found on plate 48 of the Dresden codex. It may therefore be assumed that *y* is its chief phonetic element. This gives *y'b* as the consonant elements of I, 7, leaving the vowel sound or sounds to be supplied from the connection or from some indication or sign which has not been ascertained. As we are limited in our endeavor to ascertain the vowel elements to the connection in which the glyph is found, attention is called thereto: First, it is conceded that plates 1* to 10* of this codex relate to bee culture and the honey industry; second, the character which follows (Pl. I, 8) is supposed to be one symbol for "honey;" and, third, the picture below (I, 9) represents an individual before a vessel in which something is burning or melting. To this may be added the fact that the Maya word *yi'b*, which contains the consonant elements of our glyph, signifies "to melt, dissolve, liquefy, fuse," which is consistent with all the data.

The reasons for rendering Pl. I, 8, *cub* (*cabil*), "honey," are as follows: This glyph, omitting the prefix *u* and the appendage, is substantially the same as the symbol for the day *Caban*; but the same symbol † is used in places where it can have no other significance than "earth" or "soil," whether phonetic or not, and again to indicate "honey," also a "hive" or "bee-house," and in one

* This will be discussed more fully in another paper relating to the Maya time symbols.

† Thomas: Study of the Manuscript Troano, pp. 149-151.



PLATE I.

or two places where the only seemingly applicable signification is "low," or "at the surface of," or "near the ground." Now it happens that the word *cab* has all these significations, and hence if the symbol is phonetic it may also have as many different meanings. This variety in the signification of a glyph, shown by its use, would seem to be another evidence of phoneticism, as it is difficult to explain it on the theory of being simply symbolic. We therefore translate our two characters (I, 7, and I, 8) *yib u-cab*, "melt the honey."

The compound character shown in I, 13, is found in the lower division of Dres. 18 and 19. Although it contains the same characters as those of the compound symbol I, 7, which we have interpreted by *yib*, "to melt," etc., it is apparent from the connection in which it is found that it has some other signification here, for it appears to indicate something which can be borne on the back, as in each case the figure below the text shows a female bearing the same combination on her back (Pl. I, 14). It can be carried in the hand (Dres. 18a) and placed on a dish or platter (I, 15). As *yib* (or *yb*) also signifies "a bean, or pulse," we may assume that this is the signification intended here. The two dots and little cross accompanying this symbol (Pl. I, 13, and I, 15, and the example in Dres. 18a) show that this character has a different signification from I, 7; they probably form a determinative indicating something which may be counted, as we find the same marks in one or two instances in the Dresden codex joined to month symbols to denote date. Although these are not found with the symbols on the back of the females in Dres. 18c and 19c, this was probably deemed unnecessary by the aboriginal scribe, as they are given with the same symbols in the text. In Dres. 18a, where the symbol in the woman's hand is accompanied with the dots and cross, it is probable there was no symbol in the text; none appears in the unobliterated portion.

In the hand of the personage shown in Pl. I, 16, from the lower division of Cort. 32, we observe a compound symbol composed of the same characters as seen in I, 7, and I, 13, but here without the dots and cross. The consonant elements of the word indicated, supposing the glyph to be phonetic, must, according to what has been advanced, be *y'b*. What is the word? Neither of the definitions given above appears to be appropriate here. There is not sufficient difference in form to suppose that the vowel sounds are in-

licated thereby. The figure and connection furnish the only aids in supplying them. The serpent, as we know, and as is made very apparent in the codices, is a symbol of moisture; the cross seen in the eye of the human head is also a symbol of moisture and of the winds. The serpent appears to be rising out of something denoted by the *cab* symbol, doubtless "earth" or "ground" here. These indications suggest that the figure relates to moisture. As the Maya word *yeeb* (or *yeb*) signifies "mist, small rain, dew, humidity, moisture," and furnishes the phonetic elements required by the symbol, this is probably what is indicated by it.

Pl. I, 17, 18, are copies of two compound characters from Tro. 12b*. The figure below the text represents an individual apparently marking or painting stripes on the head of an idol.

It is also noticeable that the idol head in the right half of Tro. 12*b has three stripes on it, while that in the left half has but two, indicating that it was the intention of the artist to show by these figures the workers in the act of forming these stripes. The prefix in I, 17, is Landa's *ca*, "two, twice," etc. As *bon* (*bonah*) signifies "to paint, dye, tinge, stain," and contains *b* as its chief phonetic element, "paint twice" or "paint two" may be assumed as a reasonable interpretation of the whole character. As I, 18, follows it to the right, its interpretation must agree with that giving the preceding one. As the cross-hatching is found in the symbol for the day *Chicchan* (Pl. III, 11), and also in that for the month *Pax*, we may assume that it denotes the sound *x* (sh) or *ch* (soft). The right half, as will hereafter appear, is used for more than one sound, among them *che*, "wood." As *xelche* signifies "a groove or crack," we may interpret the two, "paint the two grooves in the wood."

Pl. I, 19, (Tro. 31d) may be translated *bulni* (*bulahni*), "to choke, smother, drown." In this the character above the face with a minute parallelogram and two circular dots in it is the *l* symbol. From a careful study of Landa's *l*'s as given in his list, and his example of spelling *le*, and of the similar characters in the codices, it is apparent that both his *l* characters are derived from the same original form, the little parallelogram and two interior dots being the essential features. This original form is probably seen in the symbol for the day *Ahau*, which is the same character

* Compare Tro. 31c, where the priests are painting their oratorios or idol seats.

as the upper part of the symbol for *Likin*, "East" (Pl. I, 21). The face character of I, 19, is shown more fully in I, 20, which, according to the interpretation given the former, has *n* as its chief phonetic element. This is obtained by referring to our Pl. I, 22, which must be the symbol for *Nohol*, "South," or *Xaman*, "North." Following these indications we may render I, 20, which is found in immediate connection with I, 19, by *ban* (*banah*), "to demolish, throw down, level with the ground." As the long-nosed god (the Maya Tlaloc?) is seen below, overturning a jar of water on the sprouting corn, bending it down to the ground, the appropriateness of this interpretation is manifest.

So far the *y* symbol has been found retaining its phonetic value in some five or six different places, two of the instances being in month symbols. It may therefore be used with this value with reasonable confidence.

In the right-hand section of Dres. 41b is the glyph shown in Pl. I, 23, which we translate *yulpolic*, from *yulpol*, "to smooth or plane wood," or (as given by Henderson) "to smooth, plane, or square timber, to beat off the log." The *p* character shown in I, 6, retains here its phonetic value. By reference to the figure below the text we see an individual in the act of chipping off the side of a tree, which agrees exactly with the interpretation given the symbol. This he appears to be doing by holding in his left hand an instrument resembling a frow, which he strikes with a hatchet. The character immediately below the one given (Pl. I, 24), which we interpret *mamachah*, "to make flat by repeated strokes," appears to give further confirmation of the explanation of the picture. The phonetic value given the parts of this compound character is obtained in this way. The upper character with two wings is Landa's *ma*, except that the circular wings contain the lines or strokes which the bishop has omitted and which appear to indicate the *m* sound. The left of the two lower characters is substantially the same as the symbol for the day *Ymix*, in which *m* is the chief phonetic element, and is the same as the symbol for the month *Mac* (Dres. 49c), omitting the *ca* glyph (Pl. II, 2). The lower right-hand character is the symbol for the day *Chuen*. We thus obtain legitimately the sounds *ma-ma-ch'*.

The characters shown in I, 25, and I, 26, which follow each other in the order given (Dres. 56b), may, with strong probability of being correct, be rendered *zuy*, "the whirlwind," and *yaz*,

"to twist" (Henderson). The cross in the chief character of I, 25, appears, as a general rule, to be that which is used for *ɔ*, but there is a slight variation in the form, which changes it to *z*. One form is seen in the lower part of Landa's symbol for the month *Zip*; another in that for the day *Ezanab*. The *z* of this author's letter list is a different character, which will be shown hereafter. The suffix of I, 25 appears to be a determinative to indicate the vowel sound *u*, as it varies slightly from the form of this letter when used as a prefix. The lower character in I, 26 is presumed to be a fanciful form of the cross or (*ɔ*) symbol. As the preceding characters in the same group appear to relate to wind and storm, the interpretation given would seem to be appropriate.

The compound symbol shown in Pl. I, 27 (Dres. 60b) is connected with an important series, which, judging by the figures above and below, relates to the close of one time cycle and the commencement of another. If this opinion, the reasons for which cannot be given here, be correct, the text must relate to time. As the two chief characters in this compound glyph form the symbol for the month *Yaxkin* (Pl. I, 12) and the lower right-hand character is the same as the upper part of the symbol for the month *Zac*, Dres. 46b and c (I, 28), the whole may be translated *u-yax-kintzil*, "the first or new hour." In the column to the right, same division, is the figure shown in I, 29, but probably does not follow immediately after I, 27, as the text here appears to be read by columns. This we venture with considerable doubt to translate *9-Xul-thib*, "nine, close or end, appears," that is, "the end of the ninth (cycle?) is at hand." The face symbol is the same as that for the month *Xul* as given in this codex (plate 46b and 61, at bottom). The right-hand character appears to have *th* or *t* as its phonetic equivalent. If this interpretation be correct it will conflict with the attempts which have so far been made to fit the Maya Katunes with the Gregorian calendar, or throw the date of this codex back fully two centuries preceding the Spanish conquest, which is not probable. Nevertheless I have ventured to give what appears to be the phonetic value of the symbols.

The compound characters shown in Pl. I, 30, and I, 31 are from divisions *a* and *b* of Tro. 31, which undoubtedly relate to the planting of seed, most probably maize, as appears to be indicated by the number dropping from the hand of the planter. The first of these, I, 30, from division *a*, we must, if we retain the values

given the parts (Pl. I, 6, and I, 23, for the first, and I, 10, and I, 28, for the second part), translate *p'k* or *p'c*. As *pak* signifies "to sow seed, to plant," we obtain a phonetic value which agrees exactly with what is shown in the figure below the text. As I, 31, contains the same characters in reverse order, it is presumable that the phonetic equivalents are also reversed; this, however, does not necessarily follow, as will hereafter appear. This will give *k'p* or *c'p*, which may be *cap*, "to place in holes or fissures; to introduce," or *capak*, "to resow or seed the second time," or *kap*, the same signification as *cap*. Either is appropriate, if we are to judge by the figures below the text.

Pl. I 32, is the head-covering of the individuals in the above-mentioned divisions of Tro. 31. In this is seen our *p* glyph apparently introduced as a phonetic character; if so, it may probably be correctly translated *ppoc*, "the sombrero or hat." It will be noticed that here we have the double (*pp*), while in the preceding examples the single *p* was used. So far I have found no fixed rule by which to distinguish these phonetic elements from one another, though Landa gives different characters for the *p* sound, and I find different ones in the codices. It is possible, and, so far as yet ascertained, seems probable, that the phonetic equivalents indicated by the scribes do not always accord with those given in the lexicons.

In Pl. I, 33 (from Tro. 22 *a) is seen (omitting the prefix) substantially the symbol that Landa interprets *le*, "the lasso," and also "to lasso." As the upper character is the same as the left portion of the upper character in Pl. I, 19, and the lower portion is the same as Landa's *e*, we translate the whole glyph by *u-le*, "the lasso," or "snare" or "to snare." As this is followed by the symbol shown in I, 34, signifying *kutz* (or *cutz*), "the turkey," and the figure below the text shows a snared turkey, the interpretation appears to be appropriate. In this, the first or left-hand character is the same as that seen in Pl. I, 28, 30, and 31, and is given the same phonetic value. Turning to Dres. 1c we notice in the figure below the text the compound glyph shown in I, 35, except that in the figure it is turned on its side. Immediately below it is seen the figure of a fish which the two individuals represented are trying to catch with a seine. As this contains the same elements as I, 34, reversed, the phonetic value should be *tz'c*. Referring to Perez's lexicon we find that *tzac* is a little fish "so named;" Brasseur says

a little fish "resembling a sardine, which inhabits the senotes." This evidence furnishes a very strong indication that the characters are phonetic and that the interpretation given is correct; nevertheless we encounter a difficulty in tracing the use of the character (first of Pl. I, 35, and last of I, 34), which has *tz* as its chief phonetic element. This is found in the fact that in Dres. 48c substantially the same glyph (Pl. I, 36) is given as the symbol for the month *Kankin*. That the suffix or appendage is the month determinative or sign appears to be evident from the number of times it is found connected with month symbols and the fact that *u* is its chief phonetic element. No attempt to explain the difficulty presented by the last-mentioned symbol will now be made, though attention is called to the fact that other months are denoted by more than one symbol.

We turn to another series. In Pl. I, 37, is seen the symbol for the day *Ymix*, frequently varied in the upper part, as shown in Pl. II, 1. As *m* is the chief consonant element in the name of the day, we assume that this is the chief phonetic element of the character. As Landa's *m* differs so materially that it cannot be assumed to be the same character, and moreover does not occur in a recognizable form in the codices, we obtain no evidence therefrom to sustain our assumption. We must therefore depend upon the result obtained by tracing it through the various combinations in which it is found.

Referring to Dres. 50c, we find the character shown in II, 2, used as the symbol for the month *Mac*. As this varies from the conventional form and is followed or preceded by Landa's symbol for *ca* (prefixes are often placed below), it is possible it should be rendered *Camach* or *Camaach*, "Jaw" or "Jaws," the true or full name of the month. This would seem to indicate that the double cross-line in the upper glyph denotes *c*. Landa's symbol for this month is shown in II, 3, and a similar symbol for the same month from the lower line of Dres. 69 in II, 4. The upper portion in both is evidently this author's symbol for *ma*, though in the codices the little circles at the ends have the parallel strokes usual in the *m* character. As we find two different characters, both containing the *m* element, used to denote this month, is there not in this fact a strong proof of phoneticism?

Pl. II, 5, found on Cort. 27 a, Tro. 14b, and II, 6, from Dres. 29b, appear to be correctly interpreted by *xamach*, "a vessel,

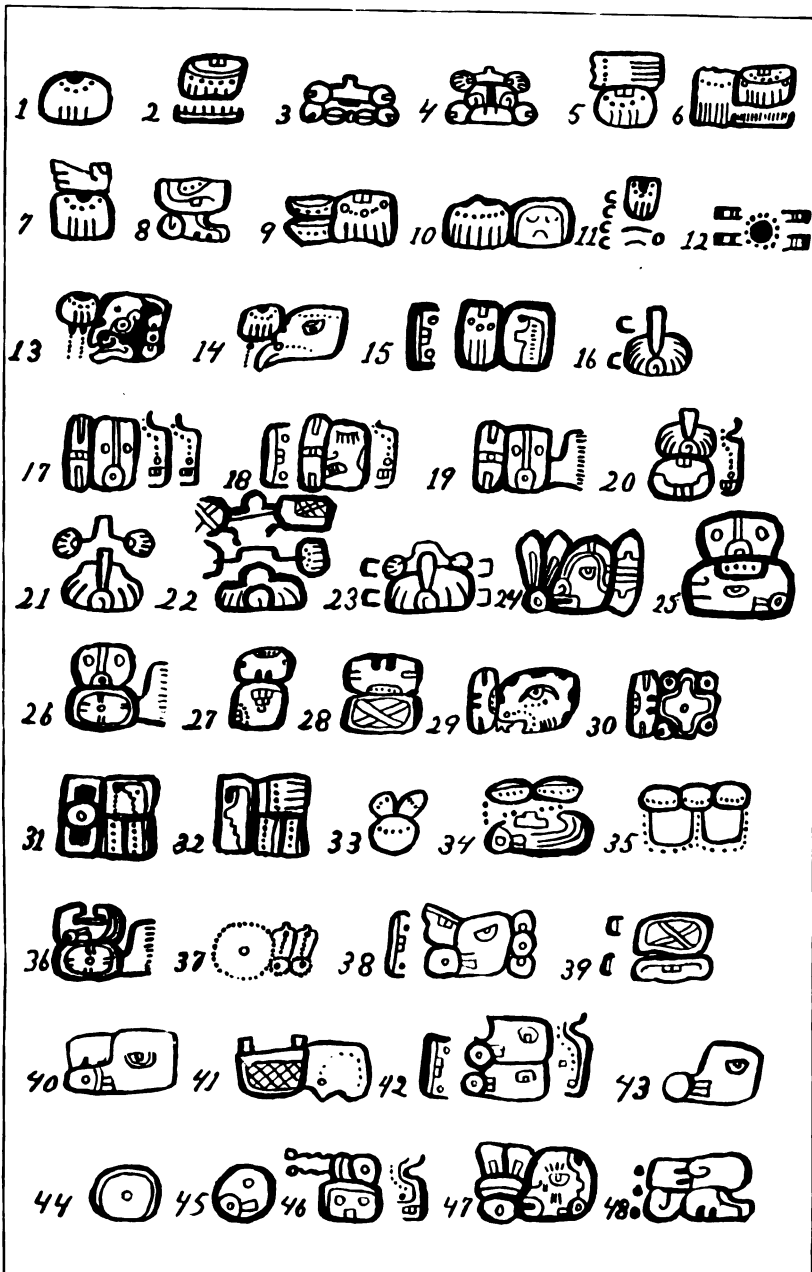


PLATE II.

large earthen pot." The connection in which it is found on plate 27 of the Cortesian codex shows that it denotes a vessel, whether phonetic or not, if we are to suppose the text has any relation to the figures below it.

Pl. II, 7 (from Tro. 17c) is probably to be interpreted by *chim* (*chimid*), "a bag, sack, a kind of net." Henderson also gives *x-much*, "a net." The object referred to is seen in the figure below the text, where it forms the net-like covering of the image head in the vessel. The latter has probably been placed here to be steamed in order to make the wood more workable. This suggestion appears to be confirmed by the accompanying symbol (II, 8), which, in a communication to *Science*,* I translated *kal*, "to imprison, close, shut in," but which should more likely be rendered by *keluc*, "to sweat." This interpretation is suggested by the subsequent discovery that the appendage has *u* as its chief phonetic element. As is now well known, the chief character of this glyph is the symbol for 20, or *kal*. The upper character in II, 7, appears to be an imperfect figure of the upper character of the symbol for *Chikin*, "West" (II, 36).

The character shown in II, 9 (from Tro. 31*b) we translate *zum* or *zuum*, "rope, cord, line;" and II, 10, which follows in the same group, may be appropriately rendered by *xel*, or rather *xelem*, "to part, separate, divide, apportion." As the first part of the latter is the same as the first part of II, 5, we obtain as its phonetic value *x'* (sh), apparently accompanied by *m* as a subordinate sound. If this supposition be correct, we have reason for believing that the parallel strokes indicate the presence of the *m* sound. However, we shall soon find an instance where the upper, dot-surrounded portion alone of the *m* character appears to indicate this sound.

The next example (Pl. II, 11, from Cort. 11b) brings before us the little hooks which Brasseur, on what authority is not known, has added to Landa's letter list, and which he justifiably asserts are signs of aspiration, or the *h* sound. As they are doubled in the example here given, the character may be interpreted by *hahaymuc*, "to bury, or inter superficially;" also "a stab, or thrust given obliquely." The first definition applies very well to the act of planting corn, shown in the figure below the text. The second agrees equally well with the idea of dibbling holes in the ground with the

* Vol. xx, No. 505, October 7, 1892.

curved stick the planter holds in his hand. The two little lines and dot below the character may possibly denote the *uc*, as this is the terminal syllable of *buluc*, "eleven," and two lines and a dot form the symbol for this number.

The character (Pl. II, 12, from Cort. 20 b) is the one above referred to, in which we have reason to believe the *m* symbol is reduced to the dot-surrounded portion alone, as *hamah*, "to make a breach in a rampart, to break down or break open," or *hemch*, "to lay a beam across a place, to traverse," appears to furnish an appropriate rendering. The evidence which seems to justify this rendering is found in the figures below the text. Attention is also called to the fact that the sign of aspiration precedes and follows the central character and *h* begins and ends the word.

The glyph shown in Pl. II, 13 is found in Dres. 14b and c, and also 46b. In each case a dark male figure is seen below the text to which it undoubtedly refers, different, however, from that which in a former publication I assumed to be Ekchuah, the god of merchants and traders. The phonetic equivalent of the upper character appears to be *muax*, "monkey, ape, imitator." The face character is probably a determinative symbol. Brasseur, under *Akab-Max*, speaks of a phantom or hobgoblin of this name which he says signified "the great monkey of the night." The upper character in II, 14 (Dres. 35c), which is substantially the same as the preceding, we render by *maach*, "the crow." The bird head is probably also a determinative symbol. In this instance nothing is seen in the figure below to confirm this interpretation.

The compound character (Pl. II, 15) is found in Tro. 9*b and 10*c. It occurs in the latter twice, the parts, however, reversed in the parallel groups, while in that of 9*b one part is placed above another. These variations do not necessarily indicate a difference in the phonetic value, as can readily be ascertained by comparing characters in the numerous parallel groups found in the codices. Omitting the prefix *u*, this may be rendered *mak-cab*, "to eat honey without chewing (that is, by sucking); to break into a bee-hive and steal the honey." As the parts *mak* and *cab* have the same signification when separate, the reversal of the parts in this instance has no bearing on the interpretation. It may be remarked that the verb *mak* is a word of several meanings. By reference to the plates of the Tro. codex on which the symbols are found, the appropriateness of this rendering will be apparent, if I rightly interpret the figures

below the text. . There we see the twisted red symbols denoting the fire kindled beneath the hives or bee-houses by which to drive out or destroy the busy little workers. In one of the fires we observe bone symbols, probably indicating a method of giving to the smoke an unpleasant odor, as rags were formerly used in some sections of our own country for the same purpose.

As the symbol having *y* as its chief phonetic element has been shown in Pl. I, 7, "*yib*," I, 10, "*yax*," and I, 12, "*yaxkin*," some additional characters containing it are presented. Pl. II, 16, from Cort. 24b, may, according to the definitions heretofore given the parts, be translated *hayah*, a word having two significations—"to stretch, extending, to stretch on a level surface," and "to demolish edifices." Judging by the figures below the text and the interpretations given to other characters found in the same series (II, 17, 18, 19), it has here the latter signification. In the middle division of this plate and of plate 25 we see what we take to be a series of inclosed graves or sepulchers, the inclosures or vaults being of wood fastened by thongs or withes. The dead are seen within, but on the top of each is a person stooping or lying down. This might be supposed to represent persons bewailing the loss of loved ones, but the text tells a different story. That shown in II, 17, we translate *paaluahal*, from *pablaahal*, "to rip open, unseam; to cut, break, or burst open." The second (II, 18) is rendered by *u paa-cimilhi*, "the inclosures of the dead." The third (II, 19) is probably *paal-tal* or some other derivative of *paaxal*, "to be broken open, ruined, depopulated." If this interpretation be substantially correct it shows us one ugly phase of Maya warfare. It is worthy of notice that the *p* character which forms the first part of the compound symbols is similar to Landa's second *p*, or rather his *pp*, though, like other symbols, turned half-way round. It may be remarked that the article in the hands of the middle figure of plate 25 is similar to those in the hands of the individuals in Tro. 23c, where they appear to be used in severing the trunks of trees. Although odd-shaped instruments to be used for this purpose, I have supposed them to be what may be termed saws, fitted with flint teeth. At any rate, they seem to have been used in some way in working wood.

The character shown in II, 20 (Cort. 11b), belongs to and immediately precedes the character shown in II, 11. Our interpretation is *ynah* (*kan*), "sow or plant seed," or literally "take to sow." The *kan* character is here in all probability the conven-

tional symbol for grain or grains of maize. The meaning of the two symbols taken together is "plant the grain of maize, covering but slightly," or "in holes made by oblique thrusts." *Inah* is the more modern form of the verb, interpreted "to plant."

Characters II, 21 and 22: Notwithstanding the confident interpretation given these characters in *Science*, October 7, 1892, further study of them leads me to doubt its correctness. It is possible Rosny's assignment of the North and South cardinal point symbols is correct. This, however, does not change the value of the *ma* and *y* symbols. In Tro. 13*d, Cort. 3b, and elsewhere the symbol for the same cardinal point is given as shown in II, 23. According to the characters, this may be rendered *ma-hayah*, "not extended or stretched out." See what is said above in regard to glyph II, 16.

In the lower division of Tro. 4 is the figure of a man, with a pack strapped upon his back and a staff in his hand. We may safely assume that this represents one of the Maya traveling merchants. On the ground in front of him are foot-prints indicative of the journey he is commencing. The text above consists only of the two compound characters shown in II, 24, and II, 25. The first consists of three elements or characters: that to the left being substantially the same as the upper part of I, 28—*zac*; the middle or chief one the same as the *n* symbol in I, 20, and the right appendix Landa's *h*, we obtain *zinah*, "to stretch, extend; to halter, bind or lash with cords." The latter definition seems, to be an appropriate rendering. The second (II, 25) we render *lechcabil* (or *lechcaltah*), "carried resting upon the shoulders, passing behind the neck." The upper character, which has *l* as its chief phonetic element, is the same as the upper character in the symbol for *Likin*, "East," shown in II, 26. Landa's second *l*, if turned half round, is seen to be a poor drawing of this character. The inclosed dotted line in the lower glyph leads me to the supposition that *e* is the following vowel element. However, without stopping now to give the reason for this belief, I may add that the two compound characters (II, 24, and II, 25) taken together may be rendered, "bind tightly (the package) behind the shoulders on the back of the neck." The surrounding day and numeral symbols indicate the lucky dates on which traveling merchants may start upon a journey.

Pl. II, 27 (Dres. 49c), denotes the month *Ceh*. It is the same as Landa's symbol minus the month determinative. It is apparent,

from the fact that the lower character of this symbol is also found in the symbols for *Yax* and *Zac*, that the word *Ceh*, if the writing is phonetic, does not give the exact phonetic equivalent. Henderson gives both *Ceh* and *Kez* as the name of the month and the Maya word for "deer." The difficulty of making this harmonize with the symbol for the month *Zip*, shown in II, 28, which, according to the value given the parts, should be *Kez* or *Ek's* or *z*, will be referred to hereafter; at present our reference is only to the first or upper character in II, 27, which appears to have *k* or *ke* or *ek* (*c* hard) as its chief phonetic element. We see here the inclosed dotted line above referred to, which seems to indicate *e* as the vowel element.

The character shown in Pl. II, 29 (from Dres. 8a), appears to be the symbol used to indicate the so-called Central American tiger, probably the jaguar. This is inferred from the fact that the figure below the text at this point and Tro. 17c is a tiger-like animal. In the latter group, however, the prefix to the glyph is wanting. Leon de Rosny appears to be justified in his interpretation *ekbalam*, "the tiger," although given by him without having reached any conclusion as to the phonetic value of the prefix. The face character is probably a mere conventional symbol used to denote the tiger.

Running through the lower division of plates 46, 47, 49, and 50 of the Dresden codex is a line consisting of repetitions of the character shown in II, 30. Here we have again our *k'*, *ke*, or *ek* symbol. The right portion of the glyph bears a strong resemblance to some of the forms of the symbol of the day *Lamat*, and is so interpreted by Brasseur and Leon de Rosny. As *ek* signifies "star" and *lemba* "resplendent, bright, sparkling," the phonetic value of the glyph is probably "the bright, shining star," alluding to Venus. According to Henderson, *eekil*, *ekil*, or *yekil* was used especially to designate this star, *zaxtal* being added to name it as a "morning star." As I have elsewhere intimated,* it is possible that Dr. Förstemann is right in supposing that the long numeral series running through plates 46-50 of this codex relates to the apparent revolution of the planet Venus.

The characters shown in II, 31, and II, 32, are from the upper part of Cort. 22, which is supposed to be the right half of the so-called "title page" of the Troano codex. By following the line

* *Science*, May 10, 1892, pp. 129-130.

in which these characters are found, through the two pages beginning at the left of the plate of the Tro. codex, the result appears to be as follows, giving the signification of the characters so far as known : first the four cardinal points in one direction, then two unknown glyphs, next the cardinal points in the opposite direction, after which follow the two characters shown in Pl. II, 31, 32. As the right half of II, 31, is, according to our interpretation of I, 8, and II, 15, *cab* or *cabil*, the whole of the compound character will probably be appropriately rendered by *yokcabil* (or *okcabil*, the *y* being simply euphonic), "above the earth," or, as Henderson, who gives two words of this form, interprets the first, "over, above the earth, above." The glyph II, 32, has *cab* or *cabil*, which signifies, among other things, "low, below, beneath," as its first element. The upper right-hand portion appears to be our *x'm* heretofore mentioned. It is therefore possible that *cabnix*, "a stair," "downward," given by Henderson, furnishes the phonetic equivalent of the compound character. This appears to be formed from *cabal*, "below, beneath," and *nix*, "to overthrow, turn over, throw down." These six directions, according to Dr. J. W. Fewkes,* were noted by the Tusayan Indians in some of their religious ceremonies. It seems probable, therefore, that the interpretation given the above-mentioned characters is correct as well as consistent with the phonetic value given to their separate parts.

Plate II, 33, is the *ku* of Landa's list. This, as usual with this author's figures, is a very rude imitation of what is intended. Our figure II, 34, represents this character in combination with another. The latter is imperfect, being partly obliterated, yet there can be no doubt that it is the same as the upper part of II, 36, the symbol for *Chikin*, "West." If the latter be phonetic, the upper part must have *ch'* as its chief phonetic element, as we know from I, 12, and II, 26, that the lower part is to be interpreted by *kin*. We therefore give as the phonetic equivalent of II, 33, *kuch*, which, according to Brasseur, is "a bird of prey, a kind of sopilote or vulture." As a strong confirmation of this rendering, the picture below the text represents a vulture eating a deer. A similar character is found in Dres. 13c, and in this case also the figure of a vulture-like bird below. Pl. II, 35, which duplicates the *ku* symbol, may be translated *kukuitz*, which, according to Brasseur, is the name of a bird

* Jour. Am. Eth. and Arch., II, p. 38.

identical with the *quetsal*. In the figure below the text is a bird perched on the shoulders of a woman—a figure that, judging by the head crest and long tail-feathers, may be accepted as an attempt to represent the royal bird alluded to.

Pl. II, 37 (from Dres. 16c), judging by the evident parallelism of the groups in this division, is the symbol of the bird pictured below the text. In this picture is easily recognized the head of the parrot. As *moo* is the Maya name of a species of parrot ("the macaw"), and the circular character of our glyph is like the symbol for *Muluc*, except that the circumscribing line is of dots, we may safely accept this term as the phonetic value. The fact that the small character is doubled, as is the *o* in the word, is another indication that the rendering is correct.

The character shown in Pl. II, 38 (Dres. 45b and c), apparently refers to the act of sewing or stitching indicated by the pictures below the text; and the little circle with two minute loops, in the left portion of the chief character, indicates the presence of *c* or *ch*. It is probable, therefore, that (omitting the *u* character) it may be correctly rendered by *chuyah*, "to sew," or some derivative thereof. This interpretation is rendered probable both by the scene pictured below the text and by the character which follows the preceding in five of the groups. This is shown in II, 39, and, according to the phonetic value given the parts, should be rendered by *Hu*, "to approach, draw near, join one thing to another," sometimes signifying carnal union (see Dres. 21c and 23c). Here, however, the signification appears to be to join the parts of cloth or other material by sewing. The little appendage projecting from the left of the main character of II, 38, is probably a determinative, possibly indicating that *u* is the vowel element; this, however, I am as yet unable to decide satisfactorily. The sub-appendage to II, 39, as has heretofore been stated (see explanation of I, 25) indicates that *u* is the vowel element.

Following up the clue gained from the glyph shown in II, 38, we present another containing the same character as its chief element. This, which is found in Tro. 35b, is presented in II, 40. It may be rendered by the Maya word *hoch*, or *hooch*, which, according to Henderson, has several different meanings—as a noun, "corn in general, cereals, harvest;" as a verb, "to gather corn from the stalk," "to empty or evacuate, to clean the pot," "to prepare to paint." It is probably used in the last sense in the

place referred to, as we see persons in the pictures below the text apparently rubbing something between their hands over a vessel. The character which follows it in the text (II, 41) has as its first part the character which forms the first part of I, 18, translated *xelche*. According to this, the chief phonetic element of this part must be *x'* or *ch* (soft). I find as yet no satisfactory clue to the second or right character; as *xak* (*xakil'*) signifies "to mix ingredients" and *cahcal* "decoction, mordant preparation to dyeing," it is probable that they suggest the meaning.

The glyph figured in Pl. II, 42 (from Tro. 11c), is a duplication of II, 38, with the suffix which as in II, 17, 18, and 20, has *ah*, *ha*, or *hal* as its phonetic equivalent. We have, therefore, as the phonetic elements (omitting the prefix) *ch'ch'-ah*. As *choch* (*chochah*), Perez, and *chooch* (*choochah*), Henderson, signify "to loosen, untie, disunite, detach," we may accept this as the translation. If this interpretation be substantially correct, it follows that the chief phonetic element of II, 43, is *ch'*, probably *cho'* or *chu'*. As the little circle and loops in the left side form the chief feature of the character, they must have *ch'* or *c'* as their principal phonetic element. It is to be observed that we find the circle and loops in the upper part of the symbol for West (*Chi*), II, 36; also in the lower part of II, 25, where *ch* is one of the phonetic elements. It is also worthy of notice in this connection that although the symbol for the day *Muluc* is usually given as shown in II, 44, yet it appears once (Cort. 30b) as represented in II, 45. The symbol for the day *Manik* may possibly be explained as an abbreviation in which only the character having *k*, *c*, or *ch* as its chief element is given.

The character shown in II, 46, which belongs to the same group as II, 42, and immediately precedes it, appears to be satisfactorily rendered by *thóltah*, from *thol*, "to slice, to cut in pieces as one does a melon." The females figured below the text seem to be hackling or slicing fiber or some material which other figures on the same plate show is to be used in making cord or thread.

In order to illustrate the complete group just referred to, which consists of four glyphs (two have been shown in II, 42 and 46), the other two are presented in II, 47, and II, 48, and a copy of the figure below the text is given in III, 1. It can readily be shown that the face character of II, 47, signifies woman or female, whether phonetic or not. The prefix is phonetic, having *z* as its chief element. The strokes in the face character, which

are seldom seen in the "woman" symbol in the Dresden codex, may indicate the *m* or *n* sound in the phonetic equivalent, possibly *eznab*, "mother" (Henderson), or *zen-Chuplal*, "the great, grand, or noted woman," alluding to some mythological character represented, or female holding position. As a very general rule, the male figures represent mythological characters, the mask worn by the priest or actor indicating the particular deity referred to. Though this is not generally true in regard to the female figures, yet there are some which are apparently intended to denote female deities or females designated to perform certain religious duties, as in the case under consideration. The same symbol and similar female figures are found in Tro. 5*c, 6*b.

The last of the group (Pl. II, 48) is a character occurring very frequently in all the codices and which, as yet, I am unable to decipher satisfactorily. The prefix is 3 or *ox*, the main character is like the symbol for the day *oc*, and the suffix has *u* as its chief phonetic element. In many places "repeat three times" gives an appropriate rendering, (Henderson gives *lic*, "time, occasion," as *hun-lic*, "one time"), but there are other places where this definition does not appear to be applicable.

In the division referred to there are four groups, each of four compound characters which may be represented by letters—thus:

a	b	a	b	a	b	a	b
c	d	c	e	f	g	h	i

In this *a* is our Pl. II, 46; *b* our II, 42; *c* our II, 47, and *d* our II, 48. As the characters indicated by the same letter are similar, it will be seen that the variations in the signification of the groups is expressed by the last two characters of a group. The *c* indicates the supposed bread symbol; *f* the supposed symbol of the Death God, and *g* the *Cimi* glyph; *h* the symbol of Dr. Schellhas' "God with the old man's face," and *i* a character which I am inclined to believe has the phonetic value *cilich*, "holy." As these terminal characters and a few others are of very frequent occurrence, is it not probable that we are to find therein reference to particular deities who rule the day noted or in whose name the action indicated is to be performed? The manner in which the character of the days is indicated as shown in the calendar given in the appendix to Stephens' "Yucatan," Vol. I, may, and I am inclined to think does, suggest the nature of these groups. If this supposition be

correct, we cannot expect to find aid in testing the correctness of our interpretations by connection in the subject-matter. When such expressions as "good; the second day of rain; the burner extinguishes the fire;" "bad; the tax on children falls due; there is sickness," etc., are used to indicate the character of the day in a calendar which appears to be a survival of these ancient codices, we have good reason for supposing that the writing in the latter is substantially of the same character.

The character shown in Pl. III, 2, from Tro. 31d, brings together some of the features shown in I, 19, and II, 40. Following the interpretation given the latter, the phonetic equivalent of the former must contain as its chief elements *h'* or *oh'*, *l'n* or *laan'*. As one definition of *hoclaantah*, "to pull up by the roots," expresses what appears to be the signification of the picture below, we may accept it as correct. This picture represents birds attacking a sitting figure, which we have elsewhere shown is probably intended to represent growing maize.*

It may be safely assumed, if we judge by the figures, that the upper division of plates 14, 15, and 16, Cortesian codex, relates to the Maya process of baking bread. Here we see a kind of oven or furnace (III, 3), through the lower portion of which the wood is thrust with which to fire it. On the ends of the pieces we see the symbol for *che*, "wood." As proof that there is an opening through the lower part of the oven to admit the wood, we have only to turn to page 16, where we have a view of it from another side (III, 4). On plates 14 and 15 the bakers are sitting by the ovens holding up their hands as though to partially ward off the heat. On 16 they sit with their backs against the oven, now cool, and hold in their hands the bread represented by the symbol seen in III, 4. Assuming this explanation to be in the main correct, the character shown in III, 5 may be appropriately rendered by some derivative of *kakamche* (*kaakamche*), *kaaktah*, *kaktah*, all of which refer to baking or roasting bread in a vessel of some kind. The glyph consists mainly of a repetition of Landa's *ca*. Possibly the signification may be found in the word *kakalkaktah*, which Perez interprets: "Asar retostando o bizcochando la cosa que quede muy seca."

Belonging to the last series is the character shown in figure III, 6, from Cort. 14a. This bears a strong resemblance to the *ahau* or

* Thomas: Study MS. Tro., 109.

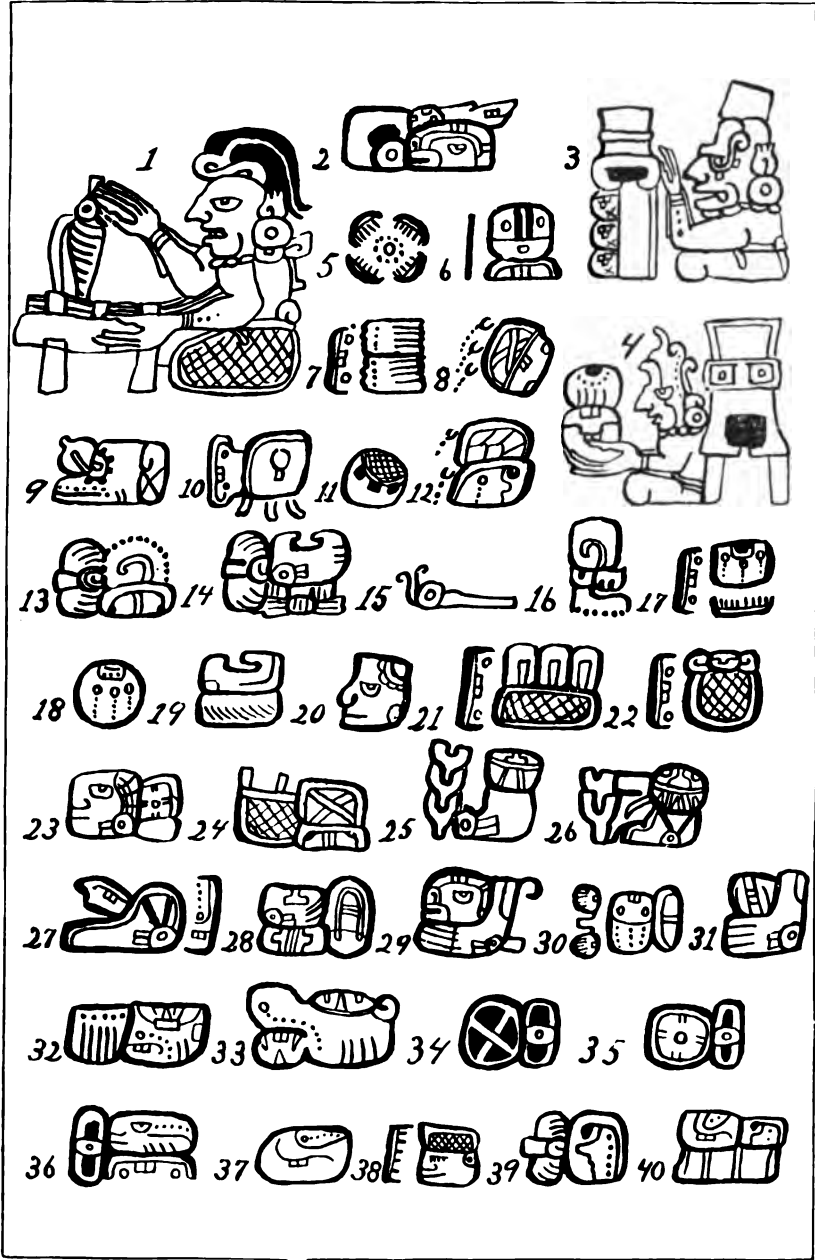


PLATE III.

/symbol; nevertheless the heavy parallels and form of the lower part of the chief character leaves little doubt that it is the *p* or *pp* glyph. It is probable that the phonetic value of this character is *opp*, "cake, tortilla, biscuit," and with the numeral prefix signifies "5 cakes or tortillas." It is possible, however, that the circular dots on the sides of the parallels are intended to denote that the *l* sound is included, or, in other words, that in this instance the *l* and *pp* symbols are combined. III, 7, found in the same connection (which is a duplication of the first part of II, 5, and II, 10), interpreted *x'm*, may possibly be rendered correctly by *u-chamcham*, "a pie" or "meat pie;" or more likely *chamchamtal*, which, from Perez' somewhat confused definition, I understand to signify "to flatten in order to allow a better draft, as a pie or tortilla"—that is, that it may bake the sooner or more thoroughly.

Running through the lower and middle divisions of plates 61-63 of the Dresden codex is a chapter or series which, from the frequent representation of falling water and other indications, we may safely conclude relates, in part at least, to storms, rains, and tempests. As it consists of short columns of three compound characters, each with a date below, we presume that it is to be read by columns downward. Although most of the characters appear to be phonetic there are reasons for believing that some of them are mere symbols.

I have as yet succeeded in interpreting satisfactorily but few of the characters, as I have no way of testing the correctness of my conclusions save by a consistent rendering of two or more that follow in succession.

Pls. III, 8, 9, 10 (Dres. 72c), follow one another downward in the order given, the three forming one of the short columns above mentioned. From the lowest, waving blue lines, indicative of water, extend downward to the bottom of the division. The first (III, 8) appears to be wholly or in part symbolic, but this conclusion is reached with considerable doubt; the chief reasons for it being, first, the fact that the symbol, from the top of which extend dotted lines supposed to indicate raindrops or falling water, is turned upon its side as though representing a structure overturned by a storm; and, second, my inability to find any consistent phonetic equivalent for it. Nevertheless, it is possible it is phonetic, and that the dotted lines should be interpreted *ha* or *haa*, "water, rain, shower" (compare II, 13), and the main character by *jan* (*janah*), "to ruin, devastate." Although this will be consistent with the

definitions I have given these characters in other combinations, the fact that the glyph is turned upon its side seems to imply that it is intended to refer to the overturning of an edifice. As will be seen when I refer to III, 12, I take this also to be a glyph referring to a dwelling.

The character shown in III, 9, I render by the Maya word *chaac*, or *chac*, "the tempest or tornado," because the head is like that of the *chas* figures found in this and the Troano codices,* and certain marks in it appear to give some of the phonetic elements in this word. The animal eye is replaced in this by a circlet of little blocks similar to that found in the symbol for the day *Chicchan* as most usually given in the codices (Pl. III, 11). The cross in the appendage is doubtless phonetic, having (*k* or *c* hard) as its phonetic value. The dog or animal head as a whole is doubtless given as a determinative to show the reference to the storm or rain. The little figure in front of the eye of the animal head should, as seen in the same character elsewhere, represent a rod passing through a little circle; it is probably a lightning symbol. In the remarkable figure, Tro. 25b, which appears to be a symbolic representation of a storm, we see a line like that shown in III, 15, extending outward from the eye, probably indicative of the lightning flash. The chief character of III, 10, is the same as the symbol for the day *Ik*. The whole symbol may therefore be rendered *u-ik* or *u-ikal-ha*, "the wind," or "wind and water," the little hooks below the character having the signification *ha*, water. Connected with the time symbols below, the column may be interpreted as follows: "At this time occurred a tempest of wind and water which overturned and ruined dwellings," with allusion to dwellings of a particular class, as there appear to be differences in the glyphs of this series which seem to be used to denote houses.

As tending to confirm this statement, we refer to a column in Dres. 71b, shown in Pl. III, 12, 13, 14, reading downward in the order given. The character shown in III, 12 I believe to be the symbol of a dwelling, the dotted lines, as before, indicating the rain-storm. In this case the lower character is phonetic, signifying *cab*, "earth or ground," and indicating that the dwelling or dwellings referred to in this instance were placed on the ground. We also notice that the interlacing lines in the house symbol are differ-

* Dres., pls. 25, 26, 27, and 28a; Tro. 26, 27.

ent from those shown in III, 8. If I am correct in the supposition that these are house symbols, it is apparent that the differences between the glyphs indicate differences in the character of the buildings. As that which is shown in III, 12, is not turned upon its side, we may suppose it was not overturned by the storm. Landa alludes to an instance of this kind where the elevated and more imposing dwellings were destroyed, while the little cabins of the newly married persons, erected near the dwelling of the father or father-in-law of the husband, escaped destruction. It is possible that Landa obtained this historical account from the very record we are now considering, for the characters III, 13 and 14, if interpreted according to the phonetic value given the parts, furnish at least a slight foundation for this surmise. The parts of III, 13, give as the chief phonetic elements *y' mu'*, *um'* or *y' mo'-'c'*. As *mukumuc* (*mucumuc*) signifies, according to Henderson, "residence, abiding place, secure abode," referring, no doubt, to its subordinate and private condition, we may interpret the whole character by *yax-mucumuc*, "the new residence." Pl. III, 14, appears to be appropriately rendered by *yaxichamal*, "married for the first time."

For a similar interpretation of the *y* character we refer to the symbol for the month *Yaxkin* (Pl. I, 12). Compare also the rendering of the appendix to III, 13, with that of the appendix to I, 23.

As there are no figures below the text in this case to aid in testing interpretations, we must be guided chiefly by the phonetic value of the characters obtained from other combinations. The interpretation given the middle and lower characters of these two columns will, as a matter of course, be more or less influenced by the conclusion reached in regard to what I have termed the "house" symbol. Nevertheless, regardless of this, the rendering of III, 9 and 10, is without doubt substantially correct, and the signification given III, 13 and 14, is consistent with the phonetic value of the parts.

As tending to confirm the rendering of III, 13, the symbol for the month *Moan* or *Muan*, as found in Dres. 46c, is given in III, 16. The chief character here is the same as the upper dot-surrounded character in III, 13.

Pl. III, 17, is from Tro. 33*b, where a savage-looking insect is figured below. As the chief character is precisely of the form sometimes given to the symbol for the day *Ix* in this codex, as III, 18 (from 5*c), and the suffix is Landa's *ca*, I translate the whole glyph

u-xacalbe, "the beetle or grub," as given by Henderson. The change of *ix* to *x* is frequent in the Maya language. For example, Perez gives *ixcucuumta* and *xcuculim* as Maya words for beetle (escarabajo). In each of the groups forming the series on Tro. 33*b, here referred to, is found the character shown in III, 19, once with and once without the suffix. Although imperfect, this is evidently our *ch'* character shown in II, 34, 36, and III, 14. We interpret it by *chi* (*chinahi*), "to bite, nip, prick, sting, as an insect." Pl. III, 20, same group, may be rendered by *nach* (*nachah*), "to grasp, to seize with the teeth or mouth." This character bears a close resemblance to some forms of the symbol for *chicchan*, in the latter part of which word we find the same phonetic elements as in the word above given, though reversed. By reference to Tro. 20*c, the so-called baptismal scene, we find the same character repeated three times in the text. As the scene probably represents mothers bathing or washing children, *nachin* or *naachin*, "beloved or loving mother," appears to be an appropriate as well as consistent rendering.

In Pl. III, 21 (from Tro. 29b and Cort. 26b), we have again the cross-hatching seen in I, 18, and II, 41, which appears to have *x* (*sh*) or *ch* (soft) as the chief phonetic element. Although the following may not be an exact rendering of the glyph, it may suggest the idea intended to be conveyed: *xaaxab*, "separate the plants in the seed-bed; transplant;" also, "having or that which has numerous forks." The figures below the text in Tro. represent Tlaloc (?), planting, replanting, or cultivating maize, which it appears the birds and animals are destroying. Those in Cort. show individuals setting up posts, each with a fork or crotch at the top. However, *u* may be the vowel, giving us *xuncul*, "having the point buried;" also, "to be seeded or planted," the former appropriate to the figures on the Cortesian codex and the latter to those in Troano.

Pl. III, 22 (Cort. 40b) we translate *halchahal*, "draw out of the pot the food, or that which is to be eaten;" also, "to disinter from the grave." The appropriateness of the first definition to what is shown by the picture below the text is apparent.

I am inclined to believe that the character shown in III, 23 (from Cort. 33b), refers to the eclipse of the sun. *Chibakin*, which appears to be a consistent rendering according to the phonetic value given the parts, signifies, as given by Perez, "eclipse of the sun; spot or mole on the body." Henderson gives *chibalkin*, "eclipse of the

sun." The figure below the text, which shows the sun in the heavens surrounded by clouds, while the great plumed serpent is in the act of swallowing it, and the Death God or God of the Under-world lies below on a bone, when examined in the light of this suggestion, is found to have a significance which would otherwise not be apparent. Pl. III, 24, which is one of the characters of the same group, contains as its chief phonetic elements *x'* or *ch'*, *y'* or *z'*, and *'c'*. As there are several Maya words which supply these elements, more than one of which may be applicable, we are unable without other aid to decide which one is the true equivalent. However, some of these are given as merely suggestive. *Xupzah*, "to waste away, to finish, to come to an end, to consume;" *xulzah*, "to come to an end." Possibly the suffix given the phonetic value *c'*, *ic*, or *ci* may be often used as a determinative.

Pl. III, 25 (from Tro. 7*c), relates apparently to the bee-house or structure figured below the text. As the lower and main character in the right portion has, according to our interpretation of Pl. II, 38, 40, 42, and 43, the phonetic value of *ch'*, usually with *o* or *u* as the accompanying vowel, it is probable that this right portion of the glyph should be translated *otoch*, "house." However, we have no guide in determining the value of the upper character, or even to assure us that it is phonetic. It is possible that it is a determinative to denote a building or structure. This seems probable from the fact that we find it used in several places where the reference is to a building or structure of some kind. For example, it is seen in III, 26, from Tro. 10*c, where a bee-house is figured below the text. Here it is joined to a different symbol from that with which it is connected in III, 25. It also appears in connection with the latter symbol in several places in the Dresden and Cortesian codices where the reference is to buildings, but the upper half is more reticulated than in III, 25, yet evidently has the same signification. It is possible that when connected with or forming part of a house symbol it refers to the thatched roofing. Possibly it may be phonetic, with *x* or *ch* as a prominent element.

The fact that the lower part of III, 26, is found in several places where it can have no reference to a building makes it evident that it has more than one signification and is most likely phonetic. As it has the two heavy lines indicative of the *p* sound, it is probable that the signification, where a structure is referred to, is *pak* (*pakal*), "a building, wall, fortification." Pl. III, 27 (from Tro. 17b), is

substantially the same character as that just referred to. It is found twice in this division; once over an individual tying a deer, where it may be rendered consistently by *pacoc* (*paccah*), "to cord, fasten, bind," or some derivative thereof (H.). However, an entirely satisfactory definition cannot be given until the signification of the prefix has been ascertained. Nevertheless, it is evident that *p'h* or *p'c* are its chief phonetic elements.

Our next example is the leading character (III, 28) from the so-called "baptismal scene" (Tro. 20c) above referred to. As it is composed of the upper character of the symbol for *Chikin* and Landa's *h* and *i*, the signification may be as heretofore suggested,* *chic-ha-ich* or *i*, "to rinse, cleanse, or wash with water the child or face." Or it may be, as is more likely, *yichintah*, "to bathe or wash another," the suffix indicating the child. The action appears to be repeated four times, once toward or in regard to each of the cardinal points, a symbol for one of these points appearing in each group. The cardinal point symbol shown in III, 29, is peculiar; no explanation, however, will be attempted at present.

As I have space for but few more examples of interpretation I give them with very brief comments.

Pl. III, 30 (from Tro. 23*a), *mamac*, "the warp of the loom," or "colored chain from the loom." The figure below the text is one of a series apparently representing pillage, and the article this fleeing personage has in his hand is probably the unfinished cloth he has stolen from a primitive loom.

Pl. III, 31 (from Tro. 25b) should, if the interpretations of II, 17, and II, 34, be correct, have *p* and *ch* as its chief phonetic elements. Although not meeting the requirements in one minor respect, *picit*, *pictah* or *picitah*, "to move the air, to fan; to make wind with a fan," would seem to be an appropriate rendering if the implement which the individual figured below the text holds in his hand be taken for a fan.

Pl. III, 32 (from Tro. 33*c), I translate *xan-tsootz*, an abbreviation of *xanab-tsootz*, "a foot covering, shoe, or moccasin made of hair, moss, or vegetable fiber." The dark object in the hand of the individual figured below the text may be intended for a shoe or moccasin, though without the help of this explanation we would never have suspected it.

* *Science*, October 7, 1892.

The translation of the preceding glyph will help us to an interpretation of III, 33 (from Tro. 17b), the phonetic value of which we take to be *tzabcan*, "the rattlesnake." It is possible, however, that the phonetic value contains the elements of *chom* (see similar glyph, Dres. 17b). It is only necessary to look at the figure below the text to see the object named. By reference to Landa's symbol for the month *Tzoz* (*tzotz* or *zot*) the reader will see where the suggestion was obtained which led to the interpretation of the two last-mentioned characters.

Pl. III, 34 (from Tro. 13*c), *eyah*, "to make play with the hands in enchantment." Pl. III, 35, same division, *kinyah*, "to divine or work enchantment; to doctor with enchantments;" also "the priest of the idols." As these are found in the section of the codex relating to the making of idols, in which there is much ceremony, the definitions given would appear to be appropriate. It is also consistent with the phonetic value assigned the parts. See II, 39, and III, 24, for first part, and II, 38, and III, 22, for the suffix. In II, 31, however, it seems to be best rendered by *yok*; at the commencement of a word it is in some cases, if not usually, *ha* or *ah*. Following this suggestion, we translate III, 36 (from Tro. 13*d), by *u-ahmen*, "the wise man, artisan, official, mechanic," etc., which is also consistent with the general tenor of the section and gives the *men* symbol its proper value.

Pl. III, 37; frequent in all the codices, = *kal* or twenty. This is found in the numeral series and its signification admitted.

Pl. III, 38 (Tro. 12*d), *xacin*, "reptile."

The characters shown in III, 39, and III, 40, from Cort. 26c, which I have elsewhere* translated *yalcab kalcab*, "gather the swarm of bees and inclose them in a hive," may possibly have a very different meaning. The Maya word *yalcab* used here is found in the Perez calendar given by Stephens in the appendix to the first volume of his "Travels in Yucatan;" thus, *yalcab u kak ahtoc*, "the burner gives the fire scope." In this it is translated "to give scope." It is a verb of the fourth conjugation, sometimes spelled *yaalcab*, signifying "to give scope or run, to flow, emanate." Although the next character has the sound of *k* and *c* (*kalcab*), we can scarcely suppose that the two words have been abbreviated to *kak*.

In closing, I again express the hope that students devoting atten-

* *Science*, July 22, 1892.

tion to this subject will use what is here presented as a basis for further efforts in the same direction. Though a considerable portion of my interpretations may not sustain the test of rigorous examination or the results of future discoveries, yet I feel assured that further investigation and study will show that I am moving in the proper direction, and that light is at last breaking in upon these mysterious records.

FOLK-LORE PUBLICATION.—The American Folk-Lore Society is devising means for the publication of a series of Memoirs, uniform in size and style with the *Journal of American Folk-Lore*. Among works already in hand or immediately available are: Angola Folk-Tales, by Heli Chatelain, the well-known Africanist and author of a Kimbundu grammar; Louisiana Folk-Tales, by Prof. Alcée Fortier, of Tulane University, New Orleans; Animal Tales of American Negroes, by Prof. A. Gerber, of Earlham College, Richmond, Ind., who has made a comparative examination of the so-called "Uncle Remus" tales, to the animal tales of other countries; Current Superstitions among the English-speaking Population, by Fanny D. Bergen, of Cambridge, Mass., and a Miracle Play of the Rio Grande, by Captain John G. Bourke, U. S. A.

It is hoped that the Society may succeed in obtaining a fund sufficiently large for the publication in the near future of at least a part of the valuable material at its command.

FOLK-LORE CONGRESS.—The final program of the World's Folk-Lore Congress to convene in Chicago during the week commencing July 10th has been announced. The subjects are classed under (A) myths and traditional beliefs, comprising twenty-three titles; (B) oral literature and folk-music, of which there are seventeen; (C) customs, institutions, and rituals, twenty-five, and (D) artistic, symbolic, and economic folk-lore, numbering five papers. There will also be given during the Congress a folk-song concert of popular songs, sung by natives of various countries, under the direction of Mr. F. W. Root. The fact that the names of the world's leading folk-lorists are associated with such a large body of material of more than usual interest and value foretells the success of the Congress.

**THE COLUMBIAN HISTORICAL EXPOSITION IN
MADRID.**

BY WALTER HOUGH.

Through the efforts of the Spanish Government there was brought together in the new palace destined for the National Library and Museum in Madrid the greatest collection of Americana ever under one roof. The building contained, side by side, the art of the Old World at the time of the discovery and that of the New World, roughly on either side of the discovery.

This exposition was unique, both from its admirable historical and scientific motive and in the taste displayed in the presentation of the valuable material. It will be a long time before a similar opportunity is afforded to compare the ethnological and archeological products from so many American sources.

The exhibits dealt mainly with the archeologic aspect, except that of the United States, which was a comprehensive collection. The twenty-four States and countries in large proportion displayed ethnological specimens only for decoration or in an unsystematic way. There were about 250,000 pieces on view, of which the United States, Mexico, and Spain showed the larger number. The floor-space measured 5,000 square meters; of this space the United States and Mexico occupied about one-third.

The United States section occupied six rooms, embracing a long list of exhibitors, both institutions and private persons. The National Museum furnished the large ethnological and archeological collections destined for Chicago, selected by Professors Mason and Wilson. It furnished also specimens of the animals encountered by the early explorers, maps, pictures, photographs, transparencies, illustrations from books on American ethnology, publications of the Smithsonian Institution, enlargements, maps, paper money, medals, etc. There was also a library of historical works, and a collection of writings on American archeology and ethnology presented by the authors.

A series of splendid relief maps was made and exhibited by Mr. E. E. Howell.

The Bureau of Ethnology contributed models of Indian pueblos, the great linguistic maps, pottery, photographs, pictures, and four cases containing a fine series from seven pre-Columbian mines and quarries explored by Mr. W. H. Holmes. These especially attracted a great deal of attention.

Philadelphia was well represented in the exhibition. The University of Pennsylvania displayed publications and monographic archeological collections from Pennsylvania, Ohio, North Carolina, and Florida. The enterprise of the Numismatic and Antiquarian Society and the Academy of Natural Sciences of Philadelphia is very commendable. The former showed a large collection of medals, paper money, and publications. The Academy of Natural Sciences exhibited 44 crania from the Morton collection, representing 35 tribes and 14 American stocks. The Philadelphia collections were in the efficient charge of Mr. Stewart Culin.

The Bureau of Latin American Republics showed a magnificent gallery of *Iconographia Columbiana*, supplemented by Mr. Curtis' own collection. These pictures formed a well-arranged and attractive feature of the Exhibition.

One large hall was devoted to the Tusayan Pueblos and was filled with the collections made by Dr. Fewkes under the munificent patronage of Mrs. Hemenway, and presented especially the religion and symbolism of the Hopi. Sand pictures and altars were shown for the first time. The ancient pottery was exceptionally fine and there was a large series of religious paraphernalia. Photographs, water-color drawings, maps and publications completed an exhibit for which Dr. Fewkes is to be highly congratulated.

Among the other exhibitors were the Geological Survey, the Army Medical Museum, Peabody Museum, Carlisle Indian School, Department of Agriculture, the Mint, Bureau of Engraving and Printing, the Post-office Department, Coast Survey, Census Office, Fish Commission, Weather Bureau, Bureau of Education, Folk-Lore Society, Anthropological Society, American Historical Association, Virginia Historical Society, Society of the Sons of the American Revolution, the Pilgrim Society of Plymouth, Houghton, Mifflin & Co., Charles Scribner's Sons, Harper & Brothers, and a large number of private exhibitors.

Mexico brought a magnificent collection of antiquities, chiefly pottery and stone, filling over 50 cases. There were casts of famous antiquities, copies of the codices, pictures, models, and pho-

tographs of the ancient ruins, and notably a grand model of the Temple Mayor of Cempoala (Vera Cruz), measuring 12 by 18 feet in area. A fine central case held the gems of the collection, such as obsidian masks, vases, labrets, mirrors, tiles, a carved notched femur (which is probably part of a musical instrument like those used in New Mexico and Arizona), copper rings, jade objects, etc. The series of obsidian rings of hour-glass shape, with wide, flat rims, worked down to a thickness of one-sixteenth of an inch and highly polished, are very remarkable specimens of lapidary work. They would tax Mr. McGuire's skill and ingenuity in stone-working. Many such problems confront one at every step in this vast and practically unworked material. One room with 14 cases is devoted to the Zapotecs. In the whole collection the relics of 23 ancient civilizations were shown. Mr. Troncoso, director of the National Museum of Mexico, is a host in himself and has an efficient staff of collaborators.

There were a number of small collections from Cuba, San Domingo, the latter consisting of human remains, weapons, idols, pottery, etc., of the aborigines and historical relics of the age of the discovery, and from Bolivia, Argentine Republic, Brazil, Chile, Honduras, Salvador, and Paraguay.

The bulk of the numbers from Guatemala were of pottery. There were many finely carved stone images, an oval dish of polished quartz of bluish tint, and an exquisitely carved bead of jade. There was also a curious globular pottery whistle or flute somewhat like an acarina, with four holes, giving five tones, running from C to F sharp, and a pottery trumpet, with four pipes blown from one mouthpiece. I do not know who is to be held responsible for the exhibition of an Egyptian scarab and a bronze *shubti* as American relics. This collection contains three rare and beautiful vases ornamented with Quiche Maya hieroglyphics. Dr. Brinton believes that these are the only Quiche Maya inscriptions yet discovered.

Nicaragua displayed a small collection of pottery in red outlined with black, stone implements, rude and polished, and a few pieces of jade and gold work.

Costa Rica occupied two halls with a fine collection, mostly of pottery and stone carvings, contained in 40 cases. The walls were covered with paintings of the excavations, maps, and photographs. This collection will be shown at Chicago. The interesting gold objects exhibited by Mr. Alfaro in Washington last summer was

displayed in one case, and two other cases held jade carvings. The pottery resembles that of Nicaragua, and consists of burial jars, cups, vases, spoons, cooking pots, etc. The stone carvings are particularly good; they are principally of friable, volcanic rock. The ornamented metates, skillfully worked stools with their seats upheld by human figures; the magnificent sacrificial stone, 6 feet long and 25 inches wide, finely sculptured at the head and along the margins and edges are especially noteworthy, while the series of stone masks, standing and sitting figures, animal and human heads, give an enlarged idea of the progress of the sculptor's art in ancient Costa Rica.

Seventy-two pounds of wrought-gold objects, 452 in number, and 383 objects of copper, invested Colombia's room with a peculiar interest. These consisted of bowls, canteens with full-length human figures, necklaces, animal and human forms, etc. There also was much pottery of a superior order from the Quimbayas, Chibchis, Chiriquis, the Department of Tolima and Antigua; a fine series of photographs was also displayed. There was a small ethnological collection from the Cunas and Guahibos. This collection was well installed and catalogued by Mr. Ernest Restrepo and was a great credit to the Republic of Colombia.

Of the 11 cases from Ecuador 10 were of the lustrous, dark, and usually indurated pottery, which is very interesting from its curious forms, among which occur long, narrow, amphora-like jars with lugs, tazzas sitting on a high, perforated foot, exactly counterfeiting Korean mortuary pottery, and square jars of Chinese form, giving this collection a strange phase. There was one case of copper axes, bored stone axes, star club-heads, labrets, and charms of worked stone. It is rather remarkable if articles which are evidently separators for pottery are found in ancient excavations in Ecuador.

Peru exhibited a large number of pottery bottles of red and black ware in human and animal forms. Four of these are in the form of human heads in which the nose is represented as having been eaten away, evidently by some disease which a Spanish physician diagnoses as lupus. There were some good specimens of gold-working, textiles, and wood-carving.

Uruguay sent a small but well-displayed collection of stone implements, comprising bolas, club-heads, arrow-heads, scrapers, hammer-stones, mortars, stone vessels, bone awls, pitted stones, and many polishers and grinders.

There were a number of probable club-heads, square to oblong in shape, roughly broken from schistose rock, which slightly resemble the obsidian heads from Easter Island in the Thomson collection at the National Museum. The greater part of these remarkably rude objects have four cusps, and are constricted midway apparently for purposes of hafting. Some of the pebbles with one smooth central pit are apparently head pieces of a drill. A good series of photographs of stone implements accompany this collection. These specimens are interesting, since they are from a new field.

Spain showed the treasures of the Archeological Museum and the Museum of Natural Sciences, which are especially rich in Peruvian and Mexican archeology. From the former country there were numerous mummies, hafted stone implements, and other objects taken from graves, cult apparatus, stone and metal work, splendid textiles and feather-work, musical instruments, and an immense series of pottery, in which are many groups of pieces evidently from the same mould. The exquisite Peruvian coat from the Royal Museum was a marvel, which for fineness of fabric, colors, ornamentation and finish it is difficult to believe has ever been surpassed. There were also many other examples of fine Peruvian textiles.

The famous Troano and Cortesian codices were displayed, and also a great deal of stone and metal work, pottery, etc., from Mexico. One case of pottery and some stone idols labeled "frauds" were very suggestive. There were also small groups of specimens from South and Central America and ethnologica from various states. The Alaskan and other Indian specimens were in few cases localized, the objects having been collected before such information was deemed necessary. The museums labor under this difficulty and there is a good field for comparative work. The Northwest Coast masks, hats, adzes, carvings, armor, etc., were collected more than 100 years ago, and range from British Columbia to Sitka. A collection of arrow-heads sent by Dr. W. J. Hoffman occupied a prominent place. The Museum of Natural Sciences had on exhibition a large collection of minerals and botanical specimens brought back from America by early Spanish explorers. The museums have been benefited by the infusion of new blood; Mr. Narciso Sentenach and José Ramón Mérida are young men who promise to do excellent work.

The Portuguese exhibit contained a few American specimens used for decoration, with other objects from different quarters of the globe

of what was apparently a fisheries exhibit. There were splendid paintings and metal-work of the fourteenth and fifteenth centuries, which should have been installed in the European exposition upstairs. Two rare Sandwich Island feather cloaks and some helmets were shown. The locality of few specimens was known.

Austria contributed an excellent exhibit of mound pottery and other objects from the United States. This collection was under the care of Dr. Wilhelm Hein, of Vienna, who is an enthusiastic worker in the field of ethnology.

Germany sent casts of the sculptures of Santa Lucia Cozumahualpa, in Guatemala, consisting of large bas-reliefs, monkeys' heads, human figures, and a large brazier in the Ethnographical Museum of Berlin. Two antique Mexican feather shields from Stuttgart, and a great number of illustrations and photographs were displayed. The gold objects from Colombia in this collection were in an elegant burglar- and fire-proof case, so fitted that the tablets upon which the specimens were mounted could be lowered into a steel vault and secured for the night. Dr. Edward Seler, of the Royal Ethnographical Museum of Berlin, was in charge, and most of the specimens were collected by him.

Sweden showed the fine collection of early maps, globes, and manuscripts of Baron Nordenskijöld, the collections from the Chukchis and the Eskimo of Port Clarence procured on the voyage of the *Vega*, the photographs, models, and specimens resulting from the explorations of Gustav Nordenskijöld in Colorado two years ago, and the objects brought from Nicaragua and Costa Rica by Dr. Carlos Bovallius. These gentlemen were in charge and arranged a very creditable display.

Norway exhibited a full-sized model of a Viking boat. The original was taken from a tumulus on the east coast of Norway in 1880.

The display of Denmark was composed of two parts, viz., one illustrating the life of the Eskimo of Greenland, the other the grade of civilization of Iceland in the middle ages. The collection was well presented, and showed in a small way the Eskimo man and woman, their houses and utensils, methods of transportation, and some of their arts. The wood carvings, textiles, and model of the house of the Icelanders were very interesting.

The documents under the efficient charge of Dr. Zaragoza were of the highest interest, and included priceless letters of Columbus

and other discoverers and conquerors, with manuscripts of the early explorers and priests.

The exposition was visited by many of the Americanists after the meeting at Huelva, among whom may be mentioned Dr. Hamy, Baron de Baye, M. Adam, Charles Read, and others. The orator, Castelar, was a close student of the collections.

On the whole, the exhibition was not well attended; but that does not detract from the commendation which should be given to the Spanish Government for the enlightened idea and the consummate ability with which this idea was carried out by the Delegate General, Señor Don Juan Navarro Reverter, Rev. Padre Fita, and their colleagues.

HISTORIC AND PREHISTORIC MOHAWKS.—The section of country where the Mohawks had their villages is mostly included in the present county of Montgomery. The sites are quite numerous, most of them belonging to the historic period. A few, however, antedate the coming of the whites. One of these, in the town of Minden, was described by Squier in his "Ancient Monuments of the State of New York." It was naturally a place of great strength, and when he saw it there may have been a ditch and an embankment at the south end; but there has been no evidence of this in many years, and, even though it existed, it would not prove, as Squier thinks, the presence of a so-called mound-building people; neither has there ever been found there any white traders' wares, as stated by Squier.

The place is prehistoric, but still Mohawk. The pottery is abundant and distinctive, and I have traced the same styles from the prehistoric sites to those occupied by the tribe when the Jesuit missionaries came here in 1642, and which were destroyed by the French in 1666; then to the villages described by Greenhalgh in 1677, and from there to the three "Castles" occupied by them until they left their native valley and went to Canada at the time of the Revolution.

All the pottery, pipes, bone awls, arrow-heads, and celts are Mohawk, and neither the "Mound Builders" nor any other people have left a trace of their occupation, even though they may have been here. It seems probable, too, from the small number of pre-

historic sites, that the Mohawks had occupied the country for but a short period previous to the coming of the French and Dutch.

The animal bones, etc., which I have forwarded came from the refuse heaps of a prehistoric village similar in all respects to the one in the town of Minden. This place is just outside the bounds of Montgomery county, on a high and commanding hill, near a stream of water. It was naturally a place of great strength and when palisaded must have been impregnable. Formerly the beds of ashes and refuse were of great extent and have yielded to persistent and indefatigable relic-hunters great stores of things illustrating the stone age of these old villagers.

As in the Minden site, the same pottery is present in abundance. I dug up fragments of one hundred different jars in one day, together with similar bone awls, celts, pipes, arrowheads, etc. One of the pipes was shaped like a canoe, and three had trumpet-shaped bowls. There is an entire absence of white traders' wares, and but one or two wampum beads and a short tube of native hammered copper to show any outside intercourse.

In the refuse heaps of the villages of the historic period there is a great mingling of native wares with those of the white traders. The distinctive native pottery, needles, harpoons, necklace bones, and ornaments are plentiful; but the bone implements are of finer make and more elaborate design, and in addition bone combs occur, evidently native but not made before the introduction of iron knives, saws, and files.

With the native objects are mingled iron axes, hoes, gun barrels, padlocks, jewsharps, nails, chisels, copper kettles, Venetian beads in great variety, Jesuit medals, crosses, rings, copper ornaments, small English clay pipes, and many other articles brought in by the traders of Albany and Schenectady.

A careful study of the thousands of relics shows that the Mohawks were not behind any of the Atlantic coast tribes as workers of stone, clay, and bone, and that their artistic sense was as well developed. That they were intellectually superior to most of the associated tribes their commanding position as Elder Brothers in the great Iroquois Confederacy sufficiently suggests.

S. L. FREY.

SOME MYTHIC STORIES OF THE YUCHI INDIANS.

BY ALBERT S. GATSCHET.

The myth explaining the origin of dry land is so widely disseminated in North America that there was probably no tribe east of the Interior Basin without a knowledge of it. This wide circulation caused it to be recounted in many different ways. I have obtained one of these relations, as modified by Yuchi story-tellers, from a pupil of the mission school at Wialaka, Creek nation, on the Arkansas river near the present settlements of the Yuchi. Here the Creator is introduced as agent, although he is scarcely in any way helpful in the creation of the land. The other land-creation story below differs in some particulars from the first one and omits the mention of a creator or great spirit, whose existence is illogical in this connection. George W. Grayson, of Eufaula, Indian Territory, obtained it from Noah Gregory some years ago.

THE ORIGIN OF THE DRY LAND.

When the Creator resolved to make a home for the living beings he had no solid matter to start with, and hence called a council of various animals to deliberate upon the matter. Among those that he gathered were the wolf, the raccoon, the bear, the turkey-buzzard, the crawfish, the loon, and the ring-necked duck. They decided that earth should be taken from the bottom of the waters, and selected the loon for the purpose, as he was known to be the best diver. The loon put white beads around his neck and plunged into the water, but the water was deep and its pressure forced the beads into the skin of his neck, so that they could not be removed, and they are sticking there even now. As he returned to the surface without obtaining any earth or mud, the beaver was ordered to accomplish the task. He dived, but the water suffocated him and his dead body reappeared on the surface largely swelled up. This is the reason why all beavers now show a thick, swollen exterior. Another beast had to plunge down on the same errand. The crawfish took a dive and soon yellow dirt appeared on the water's surface. He came near being drowned, but on reappearing he stretched up his claws,

which were examined by the animals assembled. They found some mud sticking on the inside of them, between the extremities, and handed it over to the Creator, who rolled it out to a flat mass, spread it on the surface of the waters, and it became land. The fish, whose domain was the bottom of the water, noticed the coming down of the craw-fish and pursued him for the theft, but the craw-fish managed to elude him and escaped to the surface.

HOW THE LAND WAS FIRST MADE.

The earth was all water. Men, animals, and all insects and created beings met and agreed to adopt some plan to enable them to inhabit the earth. They understood that beneath the water there was earth, and the problem to be solved was how to get the earth to the top and spread it that it might become habitable.

They chose first one and then another animal, but none of them could hold its breath long enough to accomplish the work. Finally they selected the crawfish, who went down and after a long time brought up in his claws a ball of earth. This was kneaded, manipulated, and spread over the waters (the great deep). Thus the land was formed. At first it was in a semi-fluid state and not well habitable. Now the turkey-buzzard was sent out to inspect the work. He was directed not to flap his wings while soaring over the lands and inspecting them. The turkey-buzzard on his tour of inspection obeyed orders perfectly well, but when he had almost completed the inspection, he became so exhausted as to be forced to flap his wings in order to support himself. The effect of this upon the almost fluid earth is to be seen to this day in the hills, mountains, and valleys of the earth.

YUCHI SUN MYTHS.

The Yuchis believe themselves to be the offspring of the sun, which they consider to be a female. According to one myth, a couple of human beings were born from her monthly efflux, and from these the Yuchis afterward originated. Another mythic story pretends that the head of the sorcerer who tried to kill the sun at the time of sunrise was suspended to the cedar tree; the blood trickled from it to the ground and gave origin to the Yuchi people, while other particles of the blood fell upon the cedar itself and caused it to become red-grained. The history of the three or four hunters crossing the chasm from which the sky is rising, at the

peril of their lives, appears to be only variant of the wizard losing his head. It is found among the Cherokees, Shawnees, and other tribes of the Indian Territory.* The myth below, in its modified Yuchi form, was obtained by me in the Yuchi language from a young man of that tribe at Wialaka, in 1885. The purpose of the myth is twofold: it attempts to explain the quicker motion of the sun in its morning path and the origin of the reddish or brown color of the cedar-wood texture.

In the popular belief the *Hiki* or mysterious being is depicted sometimes as an ogre or other dangerous monster; at other times as an animal with human, or rather, superhuman, faculties. The present story makes of the *Hiki* an instructor of the people in the useful arts of life. Every Indian nation has a culture-hero of this description, comparable to Quetzalcoatl, Bochika, Flint Boy, Apollo, and others, and these culture-heroes are usually personifications of the sun. No doubt the monster *Hiki* is the sun personified in a manner to suit the belief of the Yuchi people. The presence of a wizard at sunrise was evidently suggested by the appearance of sun-dogs in hazy weather.

WHY THE CEDAR TREE IS RED-GRAINED.

An unknown, mysterious being once came down upon the earth and met people there, who were the ancestors of the Yuchi Indians. To them this being (*Hi'ki* or *K'd'la hi'ki*) taught many of the arts of life, and in matters of religion admonished them to call the sun their *mother* as a matter of worship. Every morning the sun, after rising above the horizon, makes short stops, and then goes faster until it reaches the noon point. So the Unknown inquired of them what was the matter with the sun. They denied having any knowledge about it, and said, "Somebody has to go there to see and examine." "Who would go there, and what could he do after he gets there?" The people said, "We are afraid to go up there." But the Unknown selected two men to make the ascent, gave to each a club, and instructed them that as soon as the wizard who was playing these tricks on the sun was leaving his cavern in the earth and appeared on the surface they should kill him on the spot. "It is a wizard who causes the sun to go so fast in the morning, for at sunrise he makes dashes at it, and the sun, being afraid of him, tries

* See AMERICAN ANTHROPOLOGIST, 1893, p. 64.

to flee from his presence." The two brave men went to the rising place of the sun to watch the orifice from which the sun emerges. The wizard appeared at the mouth of the cave, and at the same time the sun was to rise from another orifice beyond it. The wizard watched for the fiery disk, and put himself in position to rush and jump at it at the moment of its appearance. When the wizard held up his head the two men knocked it off from his body with their clubs, took it to their tribe, and proclaimed that they had killed the sorcerer who had for so long a time urged the sun to a quicker motion. But the wizard's head was not dead yet. It was stirring and moving about, and to stop this the man of mysterious origin advised the people to tie the head on the uppermost limbs of a tree. They did so, and on the next morning the head fell to the ground, for it was not dead yet. He then ordered them to tie the head to another tree. It still lived and fell to the ground the next day. To insure success, the Unknown then made them tie it to a red cedar tree. There it remained, and its life became extinct. The blood of the head ran through the cedar. Henceforth the grain of the wood assumed a reddish color, and the cedar tree became a medicine tree.

TATTOOING IN TUNIS.—It was not long since announced in the *Revue Scientifique* that at one of the meetings of the Academy of Sciences M. Vercoutre, who has resided in Tunis, read a paper upon the tattooing of the face and limbs practiced by the native Tunisians. The fact has been established that the most perfect of these tattooings represents a doll-like human figure with the arms extended. M. Vercoutre has recognized that this figure, which has until the present time remained inexplicable, is nothing more than a rigorously exact reproduction, preserved by tradition without sensible modification, of the manikin which figures with arms extended upon the monuments of Phœnice and Carthage, and which the archeologists have called the "symbol of the Punic Trinity." The figure is also met with upon the Phœnician columns and upon the neo-punic lamps of Carthage.

G. R. STETSON.

L'Afrique de Genève states that "Sir Sidney Shepherd, governor of Bechuanaland, attributes the total absence [*sic*] of crime in his jurisdiction to the prohibition of the sale of alcoholic drinks for the last seven years."

RECENT ARCHEOLOGIC FIND IN ARIZONA.

BY JAMES MOONEY.

Early in February of this year some Navajo Indians brought to Mr. T. V. Keam, the trader at Keam's Cañon, on the Hopi (Moki) reservation in northern Arizona, several specimens of antique pottery, which they said they had found while digging for water at a point about five miles south of the trading post. Mr. Keam, as is well known, takes a deep interest in the archeology and ethnology of this section, and told the Indians to go on with the work and bring him whatever they might find. As a result, in the course of a week's digging they have unearthed about two hundred specimens of prehistoric pottery in good condition, while probably as many more have been broken in the process. This makes it the largest archeologic find in the history of this section, the next in importance as regards quantity being the cave deposit, consisting of about one hundred and sixty pieces, discovered north of St. John's about six years ago, and now in possession of Mr. Lorenzo Hubbell, of that place.

On Sunday, February 12, in company with Mr. Keam, I rode over to the spot where the discovery had been made. It is in a *rincon* or side cañon, walled in by steep cliffs perhaps 150 feet in height. Toward the south the cañon opens out into an extensive valley occupied by several families of Navajos with their herds of sheep and goats. At the north end of the cañon several springs ooze up through the rocks and sand drifts, and it was in excavating one of these that the discovery was made. Several springs have now been dug out, but pottery has been found only at one. On climbing the steep ascent to the top of the mesa we find the remains of the ancient pueblo overlooking the valley on the east. It must have been an extensive settlement in its day, as large as any of the existing Hopi villages, as the ruins cover an area of perhaps four acres, and the whole neighborhood is thickly strewn with fragments of stamped and painted pottery and flakes of flint and obsidian. The foundations of the walls are still well preserved, so that the outlines of the rooms can be distinctly traced, and by digging out the accumulated sand and débris it is probable that nearly the whole ground-plan might be restored. At the foot of the cliff, toward the

south, traces of burnt clay and charcoal show where the pottery was made, and the steps cut into the rock by which the ancient inhabitants descended to the spring are still plainly visible.

Several of the Indians were at work digging while we were there. They had excavated the principal spring, where the pottery had been found, down to bed clay, and had thrown the loosened sand out at the top. The instruments used were their hands and two long-handled shovels. The ground all around was strewn with fragments of pottery thrown out, and numerous other fragments were imbedded in the sand. It was evident that probably half the original number, including the largest specimens, had been destroyed in the digging process. By working in from the side, instead of from above, and proceeding carefully to remove the sand with the hands and some such small tool as a knife or a stick, probably three hundred or more pieces might have been taken out intact. Most of those preserved were small, finely decorated with designs in black and reddish brown, and of most unique shapes. Some consisted of three or four small bowls set together upon a common bottom, somewhat like a muffin stand. Some bowls were fashioned to represent birds, having projections standing out from the rim for head, tail, and wings. Some few had handles above like diminutive baskets; some bore a slight resemblance in form to a shoe, having the opening at one end some were of cuspidor form, and others were patterned after gourds and spoons. A few had stamped patterns upon the outside, but most were smooth, and whitish or cream-colored, with the painted designs before mentioned (see plate).

The Navajo name of these springs is *To-alchĩndi*, "little water." The Hopi name is *Chak-pá hũ*, having the same meaning. According to the statement given to Mr. Keam by the Hopi, who have occupied this region from time immemorial, the ruined pueblo, which they call Kawaska, was formerly occupied by the Indians now occupying Laguna pueblo, west of the Rio Grande. They state also that their ancestors used to deposit jars and bowls near springs as votive offerings to the water gods. This would account for the fact that the vessels were all found close together by the principal spring, and appear from their size and shape to have been intended for religious rather than practical purposes. The custom of making offerings at springs to the water deities is common to all primitive tribes, and among the Arapahos and Cheyennes I have myself seen shawls and strips of calico hung up as sacrifices upon the bushes about every little watering place in the vicinity of a regular camp.

Vol. VI, No. 3.



Ancient Pottery from Kawaika, Arizona.

**A CENTRAL AMERICAN CEREMONY WHICH SUGGESTS
THE SNAKE DANCE OF THE TUSAYAN VILLAGERS.***

BY J. WALTER FEWKES.

Certain resemblances, fancied or real, between ceremonials which, according to Spanish historians, were observed by Central American aborigines at the time of their conquest and those which are at present performed in the least modified of the so-called pueblos of our Southwest afford a series of interesting facts which, if they do not point to the kinship of these peoples, may throw light on the study of the comparative ceremoniology of the American race.

For the last two years I have been gathering information preparatory to the publication of a memoir containing observations on the Snake Dance of the Indians of the Hopi (Moki) pueblos. In the preparation of my memoir I have naturally sought among other American tribes for evidences of a similar ceremony and have not been disappointed. It is the purpose of the present article to lay before the reader a few notes which are accompanied with speculations more or less preliminary to a final account, and which it is hoped may be of interest in the discussion of the distribution of the Snake Dance or similar ceremonials. I have also published this article with a view of eliciting from others more and better observations which may add additional evidence of a relationship between widely different peoples, or else show these likenesses to be casual or meaningless coincidences.

Many years ago Padre Sahagun † described a ceremony practiced by the ancient Mexicans, which seems to me to show that they observed a festival comparable with the Hopi Snake Dance. This, taken with other facts which indicate similarity in ceremonial practices, suggests a relationship of great significance. While it is not

* This article was written last winter (1892), while the author was in charge of the exhibit of the Hemenway Expedition in the "Histórico-Americana Exposicion" in Madrid.

† My attention was called to Sahagun's description by the well-known Mexicanist, Dr. Ed. Selser, of Berlin. At my request Dr. Selser copied the Nahuatl text and sent me a German translation of it, which I have translated into English and with his permission is here published for the first time. He has also copied the figures, and I take great pleasure in thanking both him and Mrs. Selser for their kindness.

my purpose in this article to discuss the widespread distribution of the Serpent cult among the aborigines of America, I believe that a knowledge of these resemblances has a value in a final interpretation of the meaning of that weird and complicated ceremonial, the Hopi Snake Dance, no less than in the determination of the kinship of peoples who practice these rites. Studied in the light of linguistic* relationships, the resemblances in ceremonials and mythologies of tribes so widely separated have most important significances.

When I found that Sahagun had described a ceremonial with certain events suggestive of the Hopi Snake Dance, I recognized the necessity of a literal translation of his Indian manuscript, for while it was evident from the Spanish text that the Mexicans formerly celebrated a festival in which snakes were carried in the mouth, exact comparisons could not be made until we had an accurate translation of the text of the more complete unpublished manuscript. Dr. Seler has kindly furnished me a German translation of this precious document, which, it will be seen, is more complete than the Spanish description, and therefore more useful for comparison.

I have in the following pages reprinted Sahagun's Spanish† account, the Indian text of an unpublished manuscript, and Dr. Seler's translation of the latter, in German, which is the best documentary evidence at hand of the character and significance of the ceremonial which we are considering.

The following is the Nahuatl text and German translation kindly made for me by Dr. Seler:

NAHUATL TEXT.

1. Auh yn atamalqualiztli.
2. Chicuexiuhtica in mochiuhtivia yn quemmanian ipan yn muchiuaya quecholli, auh anoço quemmanian ipan yn tepilhuitl, muchioaya.
3. Auh chicomilhviti yn neçavaloya, çan tlapactli atamalli in qualoya. Amono chilo, amono yztayo, amono chilo, amo tequixquiyo, amono tenexyo: auh tlatcatlaqualoya.
4. auh in aquin amo moçaoaya ynipani in tlamachoya: niman tzacuilitloya.

* See Buschmann *et al.*; Brinton's "American Race," p. 118 et seq. The resemblance of the name of a Sonoran branch of the Uto-Aztecan stock, Opata, to Ho-pi-tù, a desirable designation for the "Moki," is close, but Mr. Gatschet informs me by letter that the etymology of the two is different.

† I have made use of the copy of Sahagun in the Congressional Library for this quotation.

5. auh cenca ymacaxoyay. in atamalqualiztli.
6. auh yn aquin amo quichioaya yntlacamo yttoya anoço machoya quil-mach xixiyotia.
7. Auh iniquac ilhvitl quiçaya, moteneva, ixnextioaya : ioan atecocoltioaya, ioan iniquac cenca muchintin mitotiaya yn teteuh : ic mitoaya teunitotiloaya.
8. ioan ixquich vncan valneçia in vitzitzilli, papalutl, in xicotli, in çayoli, in tototl, temolli, tecuitla ololo inipan moquixtiaya, tlaca, inipan valmitotiaya.
9. Auh no cequintin ipan moquixtiaya in cochiztli, in ixocotamalcozqui : ioan totolnacatl inicozqui : ioan ixpan icaca in tonacacuezcomatl tenticac xocotamalli.
10. auh no muchi, vncan valneçia inipan moquixtiaya in motolinia in motequiquilmaquilia in motequaquamaquilia : no ioan vncan valneçia in teucucuxqui inipan moquixtiaya :
11. ioan in ocequintin totome in tecolutl in chichtli ipan quiçaya ioan occequi inipan moquixtiaya.
12. Auh motlaliaya in tlalloc ixpan manca yn atl, vncan temia in cocoa, ioan cueyame,
13. ioan yn yeoantin motenevaya maçateca, vncan quintololoaya in cocoa çan yoltivia, çeçeyaca, ioan in cueyame
14. çan in camatica yn quimonanaya amo yn matica :
15. çan quimontlanquechiaya inic quimonanaya yn atlan in vncan ixpan tlalloc.
16. auh çan quinquaquativia, in cocoa, inic ipan mitotitivia maçateca.
17. Auh in aquin achto quitlamiaya coatl in quitoloaya : niman ic tzatzi, tlapapavia, quiyaoaloa in teucalli.
18. auh quintlauhtiaya in quintoloaya coatl.
19. auh omilhuitl in netotiloaya.
20. auh inic omilhuitl netotiloaya, ye teutlac in tlayavaloloya
21. nappa in moyaoaloaya teucalli.
22. Auh in xocotamalli iquac qualoya in tonacacuezcomac temia
23. muchi tlacatl concuia iniquac tlamia ilhuitl.
24. auh yiehoantin in çivaillamatque ioan vevetque ceuca chocaya quilnamiquia yn açaçomo açizque chicuexivitl quitoaya : acoc ixpan in mochioaz. y.
25. Auh inic mochivaya. y.
26. quilmach yc mocevitivia in tonacayutl
27. in chicuexiuhctia ipampa quilmach cenca tictlayhioviktia, inic tiqua ; in ticchilhvia in tiquiztavia in tictequixquivia, in moteuexvia, yuiuh-quima ticatzonmictia

28. inic ticnemitia quilmach ic mopilquixtitivia in tonacayutl, iuhqui yn muchioaya.

29. Auh iuiquac otzonquiz ilhuitl, yuimoztlayoc motenevaya, molpalolo, yehica caoneçavililoc yn tonacayutl.

GERMAN TRANSLATION.

1. Das Fest der (ungesalzenen, ungewürzten) Wasserkrapfen.
2. Es wurde alle 8 Jahre gefeiert: Bald feierten sie es im Monat Quecholli (Ende October-Anfang November), bald in Monat Tepeilhuitl (Erste Hälfte des October).
3. Sieben Tage fastete man. Nur ein Stück Wasserkrapfen ass man, ohne Capsicumpfeffer, ohne Salz, ohne Capsicumpfeffer, ohne Soda-salzerde, ohne Zusatz von Ätzkalk gekocht. Und nur (einmal) am Tage ass man.
4. Und wenn jemand nicht fastete, wer als solcher erfunden ward, der ward sogleich gezüchtigt.
5. Gar sehr respectirt wurde dieses Fest der Wasserkrapfen.
6. Und wenn es jemand nicht feierte, auch wenn das niemand sah und niemand erfuhr, von dem glaubte man, dass er zur Strafe mit Aussatz geschlagen würde.
7. Das Fest selbst hiess "wo man sein Glück macht," und "wo das Muschelhorn geblasen wird" und "wo alle Götter tanzen."
8. Und alle (Thiere) traten dort auf: Kolibri, Schmetterlinge, Bienen, Mücken, Vögel, Käfer, (essbare) Fliegenlarvenkuchen, in all diese Gestalten verkleideten sich die Männer, als solche kamen sie angetanzt.
9. Und einige ferner verkleideten sich als Schlaf (in die Gestalt eines schlafenden Menschen), als Schnüre von Fruchtpasteten, als Schnüre von Truthahnfleisch (Pasteten), und vor ihnen stand der Speisekorb, in den die Pasteten zu liegen kommen.
10. Und in der Verkleidung von Bettlern und grob- und ärmlich gekleideten Leuten traten sie auf, und als Aussätzige verkleidet.
11. Und andere verkleideten sich als Vögel, als Eule und Käützchen und in zahlreiche andere Gestalten.
12. Nun wurde das Bild *Tlaloc's* (des Regengottes) vor dem Wasser aufgestellt, in dem sich die Schlangen und die Frösche befanden.
13. Und die sogenannten *Maçateca** verschlangen die Schlangen lebendig, Stück für Stück, und die Frösche.
14. Mit dem Munde ergriffen sie dieselben und nicht mit der Hand.

* *Maçateca* bedeutet "die aus dem Hirschland." Den Namen führte unter Anderm ein Volksstamm, der im Gebirgsland östlich der Strasse nach Oaxaca seinen Wohnsitz hatte, und der, wie Brinton (*South American Languages*, Appendix) nachgewiesen hat, den Mangué-Chiapaneca und den Costa Rica Stämmen verwandt ist.

15. Nur mit den Zähnen packten sie sie, wenn sie sie im Wasser fassten, dort vor dem Bilde *Tlaloc's*.
16. Und während die Maçateca an den Schlangen würgten (die Schlangen zu verschlucken sich bestrehten), führten sie einen Tanz aus.
17. Und wer zuerst mit der Schlange fertig geworden und sie verschluckt hatte, der fieng an zu schreien, papa, papa, und tanzte um den Tempel herum.
18. Und man beschenkte diejenigen, welche die Schlangen verschluckt hatten.
19. Und zwei Tage dauerte der Tanz.
20. Und am zweiten Tanztage, wenn die Sonne untergegangen war, ward ein grosser Umzug gehalten.
21. Vier Mal zog man um den Tempel herum.
22. Und dann wurden die Fruchtkrapfen gegessen, die in dem Speisekorb lagen.
23. Alle Welt bekam davon, wenn das Fest zu Ende war.
24. Und die alten Frauen und alten Männer weinten sehr, in dem Gedanken, dass sie vielleicht acht Jahre nicht mehr erleben würden. Sie sprachen, nicht mehr vor unsern Augen wird das Fest gefeiert werden.
25. Und aus folgendem Grunde ward das Fest gefeiert.
26. Sie sagten, dass man damit die Lebensmittel ausruhen liesse
27. weil, wie sie sagten, wir in den acht Jahren unsere Speise sehr quälen, indem wir sie mit Capsicum-Pfeffer, mit Salz, mit Sodasalzerde behandeln mit Ätzkalk kochen, als ob wir sie ersäufen wollten.
28. Um die Lebensmittel zu beleben, sagten sie, um sie dadurch zu verjüngen, darum wurde das Fest in dieser Weise gefeiert.
29. Der Morgen nach dem Schluss des Festes hiess "es wird mit Pfeffersäure übergossen," weil das Fasten zu Ehren der Lebensmittel nunmehr zu Ende war.

The following is an English translation of Seler's German rendering of the original Nahuatl:

The Festival of the (unsalted, unspiced) Water Pancakes —It was celebrated every eight years. Sometimes they celebrated it in the month of Quecholli (end of October, beginning of November), sometimes in the month Tepeilhuitl (first half of October). They fasted seven days; they ate nothing but a piece of water pancake, without salt, without chile, without soda, cooked without the addition of lime; they ate only (once) a day. If any one did not fast and was found out he was immediately chastised. The festival of the Atamalqualiztli was held in very great reverence. When any one did not celebrate it, even if no one saw or learned it, they believed that he would be punished with leprosy.

The festival itself was called "Where one makes luck," or "Where the mussel shell horn is blown," or "Where all the Gods dance."

All animals appeared : humming-birds, butterflies, bees, gnats, birds, beetles, (edible) "cakes of fly larvæ"—in all these forms the men disguised themselves and as such they came dancing up; and some also clothed themselves as Sleep (in the form of a sleeping man), as strings of fruit pastry and pastry made of turkey meat, and before them stood the food basket in which the pastry is placed; and they appeared in the guise of beggars and of coarsely and poorly clothed people, and disguised as lepers. Others clothed themselves as birds, as owls and barn owls, and in numerous other forms.

The statue of Tlaloc (the rain god) was placed before the water in which the snakes and frogs were, and the so-called Maçateca* swallowed the snakes and frogs alive, one by one. They seized them with the mouth and not with the hand; with the teeth only they grasped them when they seized them in the water before the statue of Tlaloc; and while the Maçateca were trying to swallow the snakes, they performed a dance, and he who had first swallowed a snake began to cry *papa, papa*, and danced around the temple, and they rewarded those who had swallowed the snakes. The dance lasted two days, and on the second day of the dance, after sunset, they formed a great procession and marched four times about the temple. Then they ate the fruit pastry which was in the basket, and everybody received thereof when the festival was at an end. The old men and women wept bitterly, thinking that they might not live perhaps another eight years. They said : No more before our eyes will the feast be celebrated.

The festival was celebrated for the following reasons : They said that in this way the food was given a rest, because, as they said, we torment our food very much in the eight years, in that we treat it with chile, with salt, and with soda earth, and cook it with lime, as though we would drown it. They said that the festival was celebrated in this manner in order that the eatables might be restored to life and rejuvenated. The morning after the festival was called "It is sprinkled with the acid of pepper," because the fast in honor of the eatables was finished.

The Spanish text is as follows :

RELACION DE LA FIESTA QUE SE HACIA DE OCHO EN OCHO AÑOS.

Hacian estos naturales una fiesta de ocho en ocho años á la cual llamaban *Atamalqualiztli*, que quiere decir *ayuno de pan y agua*. Ninguna cosa comian en ocho dias antes de esta fiesta, sino unos tamales hechos sin sal, ni bebian, sino agua clara. Esta fiesta algunos años caía en el mes que se llama *Quecholli*, y otras veces en el mes que se llama *Tepeil*.

* Maçateca signifies "those from the Deerland." Among others with this name is a race which dwelt east of the road to Oaxaca which, as Brinton (South American Languages, Appendix) has shown, is related to the Mangue-Chiapaneca and Costa Rica stocks.

huill. A los tamales que comian estos dias llamaban *atamalli*, porque ninguna cosa les mezclaban cuando los hacian, ni aun sal, sino solo agua; ni comian el maíz con cal, sino con solo agua, y todos comian al medio día, y si alguno no ayunaba castigábanle por ello. Tenían en gran reverencia este ayuno y en gran temor, porque decian que los que no le guardaban, aunque secretamente comiesen y no le supiese nadie, Dios los castigaba hiriéndolos con lepra. A esta fiesta llamaban *Ixneztioa*, que quiere decir, buscar ventura: creían que en esta fiesta, bailaban los dioses todos, y así es, que todos los que bailaban se ataviaban con diversos trajes, unos tomaban personajes de aves, y otros de animales, y así unos se transfiguraban como *tzinizcan** otros como mariposas, otros como *abejones*, otros como *moscas*, otros como escarabajos; otros traían acuestas un hombre durmiendo, y decian que era el sueño; otros unos sartaes de tamales que llaman *xocotamalli*, otros de otras especies, que llaman *catamalli*; otros traían comida de tamales y otras cosas, y dábanlas á los pobres. Tambien tomaban personajes de estos, como son los que traen acuestas leña para vender, otros que traen verdura; tambien tomaban personajes de enfermos, como son los leprosos y bubosos; otros tomaban personajes de aves. Estaba la imagen de *Tlaloc* en medio del areyto, á cuya honra bailaban, y delante de ella estaba una balsa de agua, donde habia culebras y ranas, y unos hombres que llamaban *maxatecaz* estaban á la orilla de la balsa, y tragábanse las culebras y las ranas vivas; tomábanlas con las bocas y no con las manos, y cuando las habian tomado en la boca, íbanse á bailar, íbanlas tragando y bailando, y el que primero acababa de tragar la culebra ó rana, luego daba voces diciendo: *papa papa*.† Bailaban al derredor del Cú de este dios, y cuando iban bailando, y pasaban por los cestos que llamaban *tonacacuecomall*, dábanles de los tamales que estaban en ellos, y las viejas que estaban mirando este areyto lloraban, acordándose que antes que otra vez se hiciese aquella fiesta ya serian muertas. Decian que este ayuno se hacia por dar descanso al mantenimiento, porque ninguna cosa en aquel ayuno se comia con el pan, y tambien decian que todo el otro tiempo fatigaban al mantenimiento ó pan, porque lo mezclaban con sal, cal, y salitre, y así lo vestian y desnudaban de diversas maneras y libreas, de que se afrentaba y se envejecia, y con este ayuno se remozaba. El dia siguiente despues del ayuno, se llamaba *mopololo* que quiere decir *que comian otros cosas con el pan*, porque ya se habia hecho penitencia por el mantenimiento.‡

On page 216 Sahagun again mentions the festival of Atamalqualiztli in these words:

“Cuando hacian una fiesta que llamaban *Atamalqualiztli*, que era de ocho en ocho años, unos indios que se llamaban *mazatecac*, tragaban

* Véase la descripción de esta ave en Clavijero, pag. 48, tom. I.

† Estos semejaban á los embaidores de Faraon; tanta fraternidad lleva la idolatría de pueblos á pueblos, aunque estos no se conozcan ni traten.

‡ Sahagun, Historia General de las Cosas de Nueva España, vol. I, pp. 195-7, 1829.

unas culebras vivas por valentía, y andaban bailando y tragándolas poco á poco, y despues que las habian tragado, dábaules mantas por su valentía. Tambien estos mismos tragaban unas ranas * vivas en la misma fiesta."

From the quotations given above we learn that the natives of Mexico observed every eight years (1) a ceremonial with fasting, to which they give the name *Atamalqualiztli*, (2) or feast of unsalted, unsapiced bread (water doughnuts) or of bread and water. Several ingredients in this bread were taboo, especially salts of various kinds, and the *tamales* which were eaten were called *atamalli*. Both accounts agree that the festival came on some years in the month *Quecholli* (3) and at other times in *Tepeilhuitl*. The time of fasting was seven or eight days, and the obligation to abstain from certain food (4) was binding, and secret violation was punished by the gods, as it was held in great reverence.

In this festival it is said that all (5) the gods dance, and the animistic deities especially mentioned as personified in it are birds, butterflies, beetles, bees, gnats, etc. The priests or young men arrayed themselves in the characteristic symbolic dress of these animistic deities and performed a sacred dance about a shrine or temple. The rôle of a sleeping man was taken by one participant; others imitated persons who are accustomed to carry wool, others bore green vegetables, while still others assumed the forms of persons sick with leprosy or bubbosus. Strings of *tamales* were given to the poor.

The portion of the account in Spanish which pertains more especially to the priests who carry the snakes is translated in the following passage:

The image of *Tlaloc*, † in whose honor they danced, stood in the midst of the ceremonial, and in front of it was a pool of water where were snakes and frogs, and certain men whom they call *Maxatecaz* (6) stood on the edge of the pool and swallowed the snakes and the live green frogs. They took them with their mouths and not with their hands, and when they had taken them in the mouth began to dance, swallowing as they danced, and he who first swallowed the snake or frog then raised his voice, crying *papa, papa*. They danced around (7) the *Cu* (8) of this

* See in this connection the statement of Bourke quoted in my paper, "A Suggestion as to the Meaning of the Moki Snake Dance," that in old times the Hopi also carried other animals in their dance.

† A rain god.



PLATE I.—MEXICAN RAIN CEREMONY (AFTER SAHAGUN).



god, and as they went in the dance and passed the basket of tamales, which they called *tonacacueexamall*, took some of the tamales which were within and the old women who stood there watching this ceremony cried, declaring that before another observance of the feast they would be dead. They say that this fast is performed in order to give rest to the nutriments, because nothing is eaten during this fast with the bread, and they also say that at all other times the nutriments or bread is fatigued because they mix it with salt, lime and saltpeter, and clothe and unclothe it of diverse kinds of garments, which afflict and weaken it, and with this ceremony it is made younger. The day following the ceremony they called *Molpalulo*, that is to say, "they eat other things with bread," because they have already made penitence for the nutriment.

NOTES.

1. The interval of eight years between successive recurrences of this ceremony is indicated on Plate I (fig. 3) by the eight circular characters.

2. Atamalqualiztli, unsalted, unsalted water pancakes.

3. The months *Quecholli** and *Tepeilhuill*,† in which this ceremonial was observed, are later than that (August) in which the Snake Dance and its kindred, the Flute Ceremonial, are celebrated in the Hopi towns, although other ceremonials are mentioned by Spanish writers as occurring in these same months of the Mexican calendar. Sahagun ‡ gives a very complete account of the festivals and sacrifices in the two months *Quecholli* and *Tepeilhuill*, but these are only distantly related to that of the eight-year ceremony, although the introduction of the image of a snake, *Milnaoatl*, in *Tepeilhuill* is suggestive. According to Serna, § the Mexican month *Quecholli* is the thirteenth of one calendar and the fourteenth of another. The same author states that in the former enumeration it extends from the fifth of November until the twenty-fourth of the same month. He says (*loc. cit.*) that it is also designated *Tepeilhuill*, or festival of the little idols, which they manufactured and deposited in the hills during the ceremony.

According to Serna (p. 91), the Indians gave the name *Quechulli* to the fourteenth month of another calendar. This month began on the

*Torquemada (teste Doutrelaine) says *quechol* "Es una ave muy hermosa . . . laquel tienen los naturales en gran estimacion y precis." *Monarchia Indiana*, Part II, p. 280. *Quecholli*, "nombre de vn Paxero de pluma azul y colorada."

† Festival of the Mountains. See, for symbol, p. 121 *Arch. de la Commission Scientifique du Mexique*, tome III, part I.

‡ Op. cit., pp. 159-167.

§ Manual de Ministros de Indios, etc., *Documentos Inéditos*, Tomo civ, p. 96: "Desde 5 de Noviembre hasta 24 del mismo." *Quecholli*, says Sahagun in a note (p. 162, *op. cit.*), commenced on the 13th of November.

twenty-third of October, and in it they celebrated a festival to a god, Mixcoatl, or serpent with the head of the puma.* In the course of this ceremonial they manufactured bows and arrows for five days and sacrificed many slaves. They drew blood from their ears as a sacrifice, bathed their idols with it, and all married persons who were participants must sleep apart from their wives and abstain from wine.

The thirteenth month of the same calendar he says is called *Tepeilhuitl*, and began on the third of October. During this month a festival was celebrated in the highest mountains. They made, says our authority,† serpents from sticks of wood or roots, on which they carved a head. They likewise made wooden idols, which they called *ectotontin*. During *Tepeilhuitl*, says Sahagun (p. 67), at the festival in honor of the mountains they killed four women and one man. The man is Milnoatl.‡

4. In Seler's translation of the Nahuatl there is more specific information in regard to the kinds of food which were taboo during the festival. The custom of abstaining from certain varieties of food during religious rites is almost universal.

5. The Hopi likewise celebrate a dance called the "*All Ka-tci'-na*"—i. e., "When all the gods dance."§ There is probably a like conception in the Hopi mind in their word *ka-tci'-na* to that of the word *teotl* in the Mexican, and both are used in compounds in a somewhat similar way. The name of a divinity gives the name to a sacred dance. A Hopi *Ka-tci'-na* dance is often called a *Ka-tci'-na*, in a somewhat similar way that an aboriginal Mexican dance was known as a *Mitote* or *Mitoll*.||

At the celebration of the *So-yo'-him Ka-tci'-na* or "*All Ka-tci'-na*," when representatives of all the divinities dance, the Hopi participants may be said to clothe themselves and to wear masks or head-dresses imitating many animistic gods.¶ The custom of a priest clothing himself like the deity which he personifies, still practiced among the Hopi, is

* Serna says Mixcoatl is "culebra que tiene cabeza de gato." Brinton says ("American Race," p. 137, note) "Tarex is identified by Sahagun with the Nahuatl divinity Mixcoatl, the god of the storm, especially the thunder-storm." I am not able to explain these apparent discrepancies in the identification of Mixcoatl.

† Serna, p. 91: "A estos palos y á estas culebras vestían ó cubrían de masa de *Tzoali* y vestíanlos á manera de montes y poníanles sus cabezas de la misma masa con rostros de personas en memoria de los que se habían ahogado, ó muerto sin poderlos quemar, y otras muchas ceremonias."

‡ P. 161, *op. cit.*: "El primero era nombre llamabanle Milnoatl. Este nombre era imagen de las culebras," etc.

§ See *Journal of American Ethnology and Archaeology*, vol. ii, No. 1. The departure and return of the *Ka-tci'-nas* are celebrated in Tusayan by appropriate festivals. The Mexicans also celebrated a festival of the return of the gods. For a description of the arrival or coming of the gods, which took place in the twelfth month, *Teutleco*, see Sahagun (*op. cit.*, pp. 156, 157).

¶ See Brinton, *Library of Aborig. Am. Lit.*, No. III. The Güëgüence, pp. xix, xx.

¶ When the Hopi youths put on the mask of a *Ka-tci'-na* they "lose their identity as men and become *Ka-tci'-nas*."

recorded of the Central American aborigines by many early Spanish writers.*

In a festival of the Cholutecas, which, according to Acosta, the traders observed in honor of Quetzalcoatl, a well-formed slave, without blemish, was dressed during forty days in the same clothing (disguise) as the god † which was personified.

Several figures in the Maya codices represent human beings evidently personifying deities and wearing the symbolic masks of animal gods. One of the best instances illustrating this statement can be seen in the *Codex Cort.*, in which we have the four ‡ (“Bacab”?) (rain gods? Seler) snake deities, one of which is figured in my plate IV. If we compare the head-dress worn by this figure with the head of the accompanying snake we find them perfectly homologous, and, as we know, as can be shown by quotations from Spanish writers, that it was customary for the priest to clothe himself with the garments of the god, we may readily conclude that this represents a man wearing the mask of the snake. At the same time he may be a Rain God, but I have no doubt that in the Maya mind he stood for both, just as the *Pa-vik-ka-lci-na* or Duck *Ka-lci'-na* is at once an animistic deity and a powerful rain god, because of the natural association of the duck with water. The duck *Ka-lci'-na*, however, is not the god who causes the rain, but he intercedes with *O'-mow-uh*, the rain cloud, whose power is great in this direction. So possibly the snake god is not a creator of rain, but a powerful agent to act upon the Maya deity which causes rain to fall.

One of the strongest similarities between masked figures which appear in Mexican and Hopi ceremonials is seen in the Hopi *Na-tác-ka* of different colors and the Mexican *Coyull(s)* *chamolcoyull* (black), *xiuhcoyull* (blue), *iztaccoyull* (white), *tlapalcoyull* (pink), *tlēcōyull* (black with red flames), *tlilticoyull* (brown), and *cistalcōyull* (brown with white spots ‡), which are figured in the Madrid manuscript of Padre Sahagun. I shall later publish figures of the different colored masks of the different *Na-tác-ka(s)* and copies of the manuscript figures of the *Coyull(s)* which I made while in Madrid. It suffices here to say that the masks of both the Hopi and Mexican representatives are identical; the teeth, lips, eyes, and even the tuft of feathers (?) on the back of the head are the same in both. The Hopi wears only the head, the Mexican apparently the whole skin

* Acosta, for instance, says (p. 382): “En la vispera desta fiesta venian los señores al templo y tragan vn vestido nuevo conforme al del ydolo, el qual le ponian los sacerdotes, quitandole los otras ropas, y guardando las con tanta reverencia como nosotros tratamos los ornamentos y aun mas.”

† “A este le vestian con atavios del mismo ydolo . . . y despues de purificado el vestian en que el ydolo estana vestido.”

‡ From the presence of the fish, armadillo, etc., with these I am inclined to refer them to the cardinal points. I am led to do this by analogy with the Hopi conception of certain animals corresponding to cardinal points.

§ I interpret these *Coyull(s)* to be animistic deities of the different world quarters indicated by corresponding colors. It will later be seen that the Hopi have the same form of nomenclature for their *Na-tác-ka(s)*.

of the animal personified; but there is such a strong resemblance between the two personifications that it seems to me they are the same. Similar evidence may be drawn from the papalotl or butterfly tablets, also figured in the precious Madrid manuscript of Sahagun. He gives colored drawings of izpapalotl, çaquapapalotl, tlilpapalotl, xolapapalotl, and of a man with a papalotl tablet (?) on his back. The symbolism of these tablets bears a remarkable likeness to that used by the Hopi for the butterfly. In several ceremonies the Tusayan people still wear tablets on the back covered with symbolic figures.

6. One is reminded by the account of the actions of these personages of certain deeds performed by some of the *Tcu'-ku-wymp-ki-ya(s)* or Hopi clown-priests, or of the "stick swallowers" and Zuñi *Ne'-we-kwi*. Priest clowns similar to those of the New Mexican and Arizonian pueblos existed in the Nahuatl ceremonials, and figurines or clay-heads with knobs, which call to mind the "mud-headed" order of Zuñi and Hopi priests, are found in various Mexican ruins. Many of these were exhibited by the Mexican government in the Madrid Exposition.

Similar clowns were also recorded by Landa as appearing in Maya ceremonials, but perhaps the best description which we have of the Yucatan priest clown was by that rare old writer, Aquilar,* whose work was published in 1639 and, although quoted by Cogolludo, has been neglected by subsequent authors.

One of the most interesting habits of these clown-priests of the Mayas was their custom of singing songs and reciting ancient fables. Among the Hopi, where the priesthood is a very ancient one, their songs are very few, but are reported to be of most archaic character. In the *Ka-lci'-na* dances, as I have described in my article on the *Wa-wác-ka-lci-na*, in the Bulletin of the Essex Institute, a strange performance in which they participate is introduced, during which the clowns one by one are forced to recount some old story for the instruction or amusement of the assembled spectators.† This custom would seem to be a survival

* Aquilar says: "Tienan, y tienen farsantes que representan fabulas á historias antiguas son graciosissimos en los chistes, y motes que dizen a sus majores y juezes si son ríguosos si son blados, si son ambiciosos, yesto con mucha aquedez, y en vna palabra, y para entenderlos, y saber á quien motejan conuiene saber su legua muy bié y los frasis y modos de hablarque tienen en sus triscas y conuersaciones que son agudos y de reir Los Religiosos vedaron al principio de su conuersiõn estos farsantes ò porque cantaunen autiguallos, que ne se dexauan entender ò porque ne se hiziessen de noche estas comedias y enitar pecados en tales horas. Y aneriguando algo desto, hallè que eran cantares, y remedios q hazen de los paxeros cantores y paleres, y particularmente de vn paxaro que cata mil cantos, que es el Çachl, que llama el Mexican Cençonlatoli, que quiere dezir de cien lenguas. Llama a estos farsantes Balsam: y por metafora llaman Balsam al q se haze o gracioso desir o y chocarrero."

† The stories told by the *Tcu'-ku-wymp-ki-ya(s)* in the performance referred to are generally tales of old time which they have heard from their fathers or incidents connected with their early life. Many, or rather most of them, are obscene, and if they have taken the place of fables and histories the modifications have not been particularly edifying. Still the practice can be looked upon as a survival. All the remaining description of the Yucatan clowns given by Aquilar applies equally well to the Hopi priest-clowns.

connecting them with the priest-clowns of Central America, as recorded by Aquilar.

7. Around the plate which illustrates the text of Sahagun will be noticed a row of figures of feet which indicate the direction of motion, possibly of the dancers, about the "*Cu*" (shrine, temple). These silhouettes of feet face the same way, or in the direction which I have elsewhere designated a sinistral* ceremonial circuit. (See Plate I.) In a figure of a Mexican calendar figured by Colonel Doutrelaine (Arch. de la Commission Scientifique, tome III, part 1) from the collection Boban, a similar row of foot-prints indicates motion in an opposite (dextral) circuit.

The ceremonial circuit of the Mayas, like that in most ceremonials of the Nahuas, is (always?) sinistral as among the Hopi and other sedentary peoples of our Southwest, but is generally opposit† that of the nomadic tribes of the United States.

The determination of the direction of the ceremonial circuit of the Mayas and other Central American peoples is important, considering the discussions which have arisen in regard to the sequence in which glyphs or figures on monuments or in the so-called books or codices which are extant should be "read." It is my conviction that the ceremonial circuit of both Nahuas and Mayas is always sinistral, but there is still wanting proof to demonstrate that such is the case. Many facts which point that way can be mentioned, of which I have chosen only a few. One of the examples of the sinistral ceremonial circuit of the Mayas was recorded by Landa in his account of the observances before the four "piles of stones" (shrines?) at the four cardinal points—south, east, north, and west.‡ In this observance the sequence followed the sinistral circuit and began at the south, which is significant.

The direction or sequence in reading (?) the rows of dots in the so-called "*Tableau des Bacab*" of the *Codex Cortesianus*, as pointed out by Professor Cyrus Thomas,§ follows a sinistral ceremonial circuit. Professor Thomas' argumentation on this point seems to me conclusive, and the arrangement of figures and enumerative marks in this "*Tableau*" points to the sinistral circuit. It seems to me that we can also use a knowledge of a sinistral ceremonial circuit in an explanation of the four direction signs corresponding to the cardinal points in the same "*Tableau des*

* Opposite the motion of the hands of a watch and opposite the apparent motion of the sun in the northern hemisphere. A direction of movement in ceremonies with the center on the left hand.

† In most of Catlin's figures of nomad Indian dances the circuit is dextral. In two pictures of a Sioux war dance the ceremonial direction taken by the celebrants is sinistral.

‡ The Hopi villages have a shrine at the north, one at the west, one at the south, and one at the east, which are used ceremonially. See in my Snake Dance memoir the deposit of *bi'-ho(s)* by the courier, *Ka'-kap-ti*.

§ Annual Report of the Bureau of Ethnology, 1881.

Bacab." The sign placed above the figure with opened breast* indicates, according to Thomas, the north, and the relationship with Mexican ceremonial and mythological systems would support this supposition, if it were not proven in other ways. Adopting, then, the sinistral circuit in reading the signs which indicate the cardinal points, it is evident that passing to the next symbol with the center of the figure on the left hand we would meet in sequence in the four "world quarters" of the "Tableau" the signs for west, south, and east.†

Perez, in his "Calendar wheel," gave the exact sinistral ceremonial circuit, in which *Kan* is east, *Muluc*, north, *Gix*, west, and *Cauac*, south, and Landa had the same sequence and enumeration. Brasseur accepted the same order in his interpretation of the arrangement of the cardinal points. The statements in Aquilar and Cogolludo seem to show that the sinistral ceremonial circuit was not necessarily always followed by the aborigines of Yucatan. According to Aquilar, the first symbol or cardinal point is "*Cuch*," east; the second, west; third, south, and fourth, north. Mentioned in this order we do not follow a true sinistral ceremonial circuit, but, as pointed out by Mr. C. P. Bowditch, while apparently not following the sinistral circuit, Cogolludo's arrangement is in reality identical with that of Perez.

The figures graven on Yucatan altars and buildings do not face in the same direction. In making their sand mosaics the Hopi always place the figures facing in such a way as to have the center on their left hands. I think, however, these differences can be harmonized in some instances with a belief that the Mayas generally adhered to the sinistral circuit.‡

8. Cu, shrine. A Hopituh word for house is *ki*, shrine, *ba-hó-ki* ("bá-ho-house"), *ki-bva* (estufa). Bandelier (Final Report, part I, p. 254) was informed by Mr. Walker that "nearly every village" (of the Pimas) "has a separate building called Tyi-in-ki, or house of speech." Civano Ki (Casa Grande) has the same terminal (*ki*). Brinton gives *kil* as the Opatá for "house" (*op. cit.*, p. 337).

We find, on a study of the description of Sahagun in connection with the Hopi Snake Dance, that there are many differences between the two, but that the most striking resemblance is in the carrying of the snake in the mouth of the participants. The Mexican *Mas-*

* See discussion of "Death God" in Schellhas, *Zeit. für Ethnologie*, 24th year, 1892, part ii. I believe that both of the seated figures in this quadrant are "Death Gods."

† See Thomas, *op. cit.*, pp. 37-40. If the sinistral ceremonial circuit was always used by the Mayas, as I believe it was, having determined the sign for north, there is no doubt about the other three.

‡ For a discussion of the position of figures in the sand mosaic of the Antelope Society in the Hopi Snake Dance, see my article in the *Journal of American Folk-Lore*, vol. v, No. xvi, 1892, on "The Ceremonial Circuit of the Village Indians of Northeastern Arizona."

cateca swallow (?) the snakes and frogs, and the *Tcu'-a-wymp-ki-ya* of the Hopi carry the snakes in their mouths between their teeth.

It is interesting to note, however, that Tlaloc, a water god, is a prominent deity in the Mexican festival, which indicates that it is a rain ceremonial, as I have elsewhere shown is the case with the Hopi Snake Dance and its kindred, the Flute Celebration.* It may be pointed out that Quetzalcoatl, the Feathered Snake, is not mentioned in Sahagun's description or text in connection with this festival. No effigy† of *Ba'-lü-lü-koñ*, the Hopi plumed snake, was seen in the Snake Dance, although figures of the same adorn the kilts of the snake priests. The introduction of the butterfly with the serpent in a Mexican ceremony described by Mendoza calls to mind the *Ho-kd'-na-ma-na* or "Butterfly Virgin" tile, which occupies a prominent place on the altar of the Antelopes in the Hopi Snake Dance at Walpi. The *ectotonti* or serpents made of wooden slabs, mentioned by Sahagun and Serna (*op. cit.*), can be found in similar objects which have been described by me in my account‡ of the Flute Ceremony, which is similar in essential points to the Snake Dance, with which it alternates every two years.

The resemblances between a ceremony practiced in the heart of Mexico and that still kept up in Arizona naturally leads one to look for likenesses in symbolism, especially that pertaining to the mythological Snake among the two peoples. It would be especially suggestive to find such symbolism identical in objects connected with serpent rites. Among the Nahua people I have not found a close likeness in symbolism of the snake, but with the Mayas there is a remarkable case of similarity or identical symbolism apparently connecting the plumed snake of Yucatan with that of the Hopi towns. The Maya codices afford interesting evidence bearing on this point, but although the resemblances in the symbolism of the conventional plumed snake of the Maya codices and the feathered snake of the Hopi are great, this resemblance does not apply to all snakes which are represented in the aboriginal literature of Yucatan.

I have already called attention to the symbolic markings on the

* A suggestion as to the meaning of the Moki Snake Dance: *Journal of American Folk Lore*, 1891.

† I shall later describe a Hopi ceremony in which the effigy of the great plumed snake appears in a most suggestive connection with symbols of the sun.

‡ *Journal of American Ethnology and Archaeology*, vol. ii, No. 1, p. 115.

head and body of *Ba'-lü-lü-koñ*, the crested, plumed serpent of Hopi mythology. To explain the following comparisons I will repeat what I have already published.* Two good representations of *Ba'-lü-lü-koñ*, which serve for a comparison of its symbolism with that of the Maya plumed snake, are known to me, viz., four pictographs and the figures (which represent the body only) on the kilt (Pl. II) of the Snake priests. The former were figured in my paper on "Tusayan Pictographs." The head of the Hopi *Ba'-lü-lü-koñ*, as represented in the pictographs, is drawn as follows: On the top it bears a crest of radiating marks or scratches standing at an angle. These represent feathers, if we trust the explanations of the priests. In front of this crest there is a horn-shaped appendage curving forward, and from a slit which represents the mouth there hangs an oval pyriform dependent ring. The body scratched on the rock bears the following symbolic markings, both in the pictographs referred to and in the zigzag figures painted on the snake kilts. These markings are of two kinds, one of which are two short parallel lines † extending lengthwise of the body, the other alternating with these arrow-shaped markings, of which there is one between each consecutive pair of parallel lines. They point toward the head of the serpent. On the snake kilt (Pl. II) the zigzag body of *Ba-lü-lü-koñ* is painted lengthwise across the cloth and is colored black, with white lines on each margin. The parallel lines and alternate arrow-marks are painted white. On one snake kilt which I have examined the pairs of white markings are not parallel with the body, but are represented as arising from one side, obliquely placed as regards the longer axis of the reptile represented. This solitary instance we shall see is highly instructive. The combination of symbolism expressed by the markings above described on dance paraphernalia and in pictographs is characteristic of the Hopi *Ba-lü-lü-koñ* or great feathered mythologic snake.

In my studies of some of the snakes depicted in the Maya codices

* "A Few Tusayan Pictographs," *Am. Anthropol.*, Jan., 1892. I am quite conscious of the distinctions which are recognized by ethnologists between Nahuas and "Mayas," and also that similar symbolism on Maya codices and Hopi pictographs proves nothing in a comparison of the Snake Dance of Tusayan villages and Nahua ceremonials.

† More or less fanciful explanations of the symbolic meaning of these two lines have been given me by Hopi priests. I am about convinced that they are symbolic of feathers, but this opinion is subject to a revision. In the same way I interpret the parallel red lines on many Hopi dolls. In some of my best Hopi dolls feathers are used to cover the body, but in the simpler, generally female, alternate red and white lines take their place.

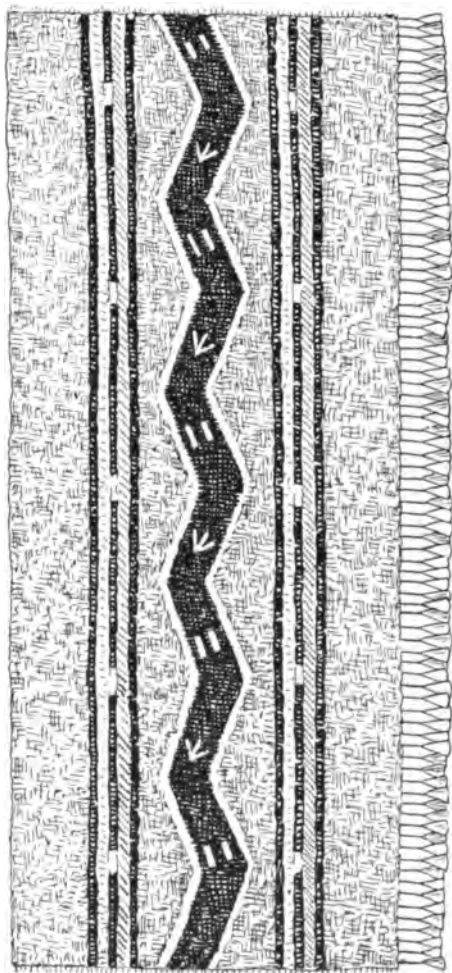


PLATE II.—Kilt of Tusayan Snake-Priest.

(*Codex Troanus* and *Codex Cortesianus*) I was struck by symbolic markings on head and body, similar to those on *Ba'-lü-lü-koñ*. There were, to be sure, other more complicated symbolic figures in the representations, but the following resemblance appeared to me extraordinary.

The most striking likenesses between the *Ba'-lü-lü-koñ* figures and those of the snake of the codices are the two parallel marks alternating with other symbols on the body. In the Maya representations these two marks, although parallel, are set obliquely to the axis of the body, as in the single specimen from Tusayan referred to above, and the arrow-shaped figures are replaced by others which have no resemblance to them. Several snakes figured in both *C. Tr.* and *C. Cort.*, some with, others without a plumed head, bear these markings, and several figures of the same animal are wholly without body markings.

Turning now to the examination of the symbolism of the heads of the plumed snake of the Hopi and Mayas, we find other similarities besides that of the symbolic marks referred to. In some of the figures of the snake from the codices the head-dress is most elaborate, in others very simple, but it is the most elaborate which most forcibly reminds one of representations of the heads of the Hopi *Ba'-lü-lü-koñ*. Of these heads I have chosen a type from the Cortez codex (Pl. III) for the description which follows:

Head green, with open mouth and red lips, in which a row of black dots is painted; upper jaw with two pendent white tooth-shaped projections. Out of the angle of the lower and upper jaw hangs a curved "tongue" (?), extending downward and backward. The eye is oval, with curved lines in the pupil, capped by a crescentic figure which projects above the head. Radiating from this cap there are three triangular-shaped bodies which represent feathers, and from the ocular cap extending forward over the nose there is a red-colored body enlarged at the end. The snake's head is generally colored green,* some are white and brown, but none red or yellow.

Several variations from the type described exist in the different figures of the feathered snake of the codices, and these variations

* See note on page 7 of Brasseur's edition of *Popul Vuh*. Gucumatx is the blue or green colored snake. The Mayas, like the Hopi and many other tribes of the United States, did not distinguish blue from green in the ceremonial use of these colors.

probably have a meaning which it is not my purpose to consider in this place.*

I venture to call attention to two homologies between the head described as a type and that of the *Ba'-lü-lü-koñ* of the Hopi. The tongue-shaped pendant from the mouth corresponds with the oval ring from the snout of the pictograph, and the crest and curved horn are similar in both. Along the ventral line of some snake figures of the Maya codices there extends from head to tail a band, generally red, which is enlarged into a vasiform body, out of which falls parallel lines, symbolic among the Maya as among the Hopi of falling water or rain. One of the Hopi pictographs of *Ba'-lü-lü-koñ* is represented with four udders, and in the folk tales of these people it is said that the waters of the world come from the breasts of the great snake. It would seem as if the Maya had a similar conception and that the vasiform body was in some way connected with some tale which they had of the origin of water from their mythological plumed snake. I will in this connection call attention to the fact that in the *Codex Tr.* a female figure † bearing for a head-dress a well drawn snake is represented with the symbolic lines of water streaming from her breasts.

It is not in the codices alone that we find the symbolic markings of the body of the feathered snake, but in certain sculptured bas-reliefs as well. I have not yet found the two parallel marks ‡ on any of the Yucatan monuments as well brought out as in the *C. Cort.*, but on the snake accompanying the figure to the right of the "Adoratorio" of Casa No. 3, at Palenque (see Stephen's Yucatan, vol. II), there are several pairs of these symbols, each consisting of two elongated crescents or double hooks, found on the serpent's body of the codex. The figure on the altar with this snake is represented as "blowing through a tube" or some musical instrument, which naturally recalls the flageolet, and leads us to think of the

*On this point I have arrived at a conclusion which is somewhat opposed to that generally accepted.

†The Hopi have a female deity for every male, and it is possible that the same may be true among the ancient Maya. There is very little likeness between the mask of the "Snake Woman" of *C. Tr.* and that of the priest personifying the snake, as represented so often in *C. Cort.*, but the interpretation of their symbolism leads me to believe them related.

‡The handles of many dippers from the ruins of Cibola and Tusayan are decorated with alternate sets of horizontal and transverse bars. An identical ornamentation occurs on a Nahuatl (?) dipper exhibited in Madrid as a receptacle for a burning offering of copal.

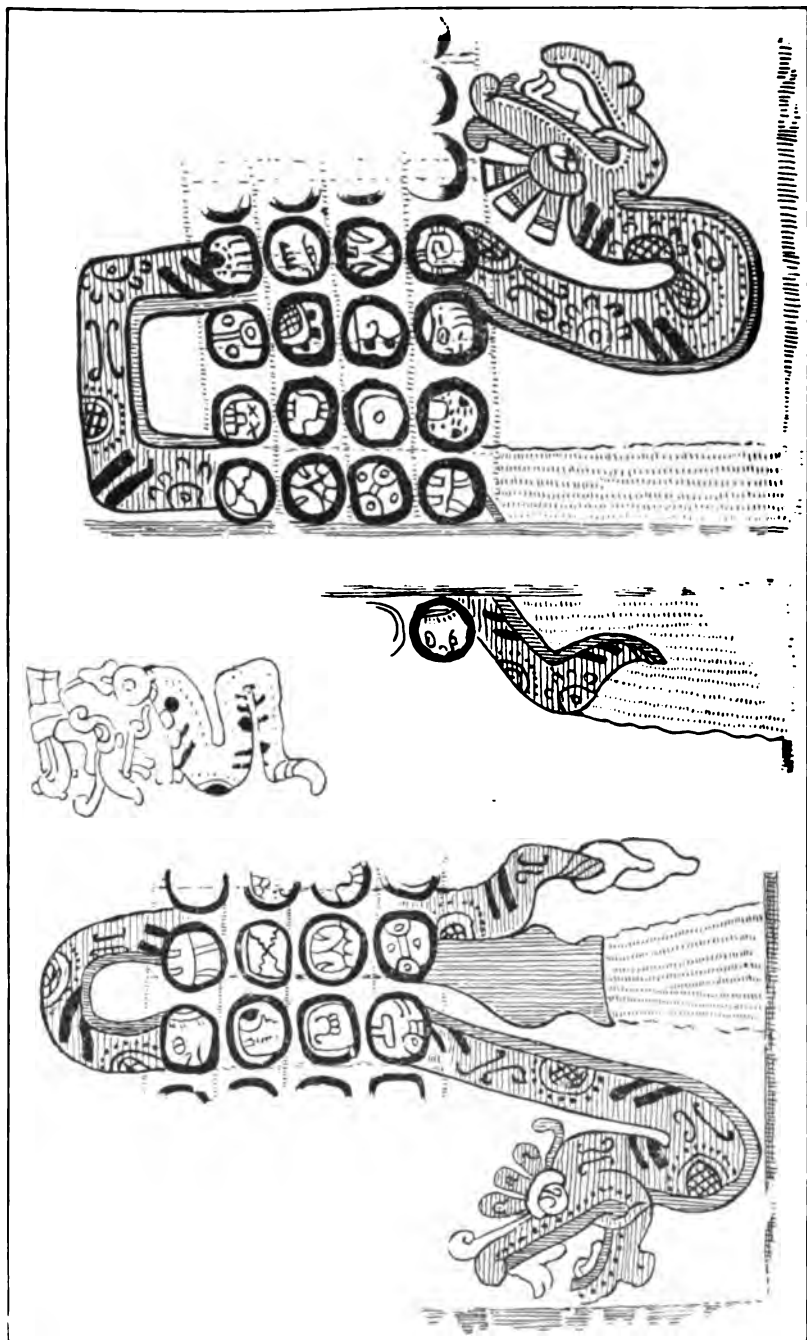


PLATE III.—Mythological snake (after Codex Cortesianus).

so-called Flute Ceremonial. This figure Holden takes to be the "sorcerer," Tlaloc. It is probably a personage connected in some way with rain, but whether a rain god or a priest officiating in ceremonials for rain I do not know, but incline to the latter opinion.*

The literature† describing the ceremonials in which the Feathered Snake is introduced in Central America is voluminous. Between Quetzalcoatl, Kukulcan, and the various other names under which this personage figures, and *Ba'-lü-lü-koñ* there are many points of resemblance, but I have not yet found that the Hopi associate with their god the idea of a beneficent law-giver or wise reformer. I have not yet found that the Hopi entertain the same idea of *Ba'-lü-lü-koñ* that the Mexicans did of Quetzalcoatl. Experience has taught me, however, not to declare that such an association does not exist in their conception of his attributes.

In the codices we find figures of animals and human beings with heads drawn in the same way, and we may conclude that the two have some intimate relationship. We have, for instance, a snake's body with symbolic markings and a head almost identical with the head of an accompanying human being. It is reasonable to conclude that the human being personifies the snake, wears the mask‡ of the snake, as shown in Pl. IV. He represents the feathered snake ceremonially. From a study of the figures of the codices we may thus be able to reconstruct the mythological system§ of the Maya from the pictures without regard to the hieroglyphic symbols. Following this method, which is by no means a novel one, I have introduced a figure of what I regard as one of the snake gods|| in my representation (Pl. IV) of the Plumed Serpent of Yucatan.

* According to Sahagun (p. 5) the Mexicans had a goddess, Civacoatl, "mother of the snake," "mother of twins," who was called Tonantzin, our mother. If the Mexicans believed that Civacoatl or a snake mother was their ancestor it would not surprise a Hopi snake priest, who traces his ancestry to the *Tcu'-a-ma-na* or snake virgin whom the snake hero, Tiyo, the legend says, saw and married in the underworld and brought to his people, but who gave birth to snakes. In the legendary dramatization of the Snake Dance she is personified in the Tusayan *kib-vus*. See, for another meaning of Civacoatl, Brinton, *Rig-Veda Americana*.

† See Acosta, pp. 388-392; Serna, *Documentos Inéditos*, Tomo civ; Sahagun, Gomara, Herrera, Clavijero, *et al.* Gomara (Cronica, p. 199) mentions the fact that in the festival of Quecholli rattlesnakes ("culebras del cascabel") are carried in the hands.

‡ The symbolism is always best expressed in Hopi personification by the head-dress. This is common among all primitive people, and is well seen in a study of the figurines or dolls of the Tusayan villages.

§ See Schellhas, Selser, *et al.*

|| I have no cause for controversy with any one who may consider this a "rain god," and I am willing to designate it a "snake rain god," for it seems to me that the identity of its mask with the head of the adjoining snake connects the two.

It has not been my intention in the preceding pages to compare all the aboriginal ceremonials of the people of Central America and those at present practiced in Tusayan. A large literature is in existence treating of the former, and we are beginning to become acquainted with the details of the latter. Several most important works on the religious practices of the Mexicans have long been overlooked on account of their rarity, but are now being published in Spain and in Mexico. There possibly still remains among the unpublished manuscripts in the precious collection of the Lonja, in Seville, other documents bearing on this part of the subject which historical research will bring to light.* There is also a call for observations on the survivals of old culture in folk-lore among existing tribes of Mexico and other countries of Central America. The study of documentary accounts and modern survivals should go hand in hand, and, forming the body of data thus accumulated, it will be possible to enter the field of comparative ceremoniology of the American race better equipped than ever before, and to make an exhaustive comparison which will throw light on individual likenesses.

One is tempted to indulge in a theory as a working hypothesis. From the speculative side it seems probable that there is an intimate resemblance between some of the ceremonials, the symbolism, and mythological systems of the Indians of Tusayan and those of the more cultured stocks of Central America. In my opinion, we are not yet justified in offering any but a theoretical explanation of the origin of the Hopi ceremonial and mythological systems, but their intimate relationships with those of the neighboring Pueblos indicates a close kinship. How much has been derived from the Pueblos and how much from other stocks can only be answered by more research. The facts here recorded look as if the Hopi practice a ceremonial system of worship with strong affinities to the Nahuatl and Maya.

I have not yet seen enough evidence to convince me that the Hopi derived their cult or ceremonials from the Zúñians or from any other single people. It is probably composite. I am not sure that portions of it were not brought up from the far south, perhaps from the Salado and Gila by the Bat-kin-ya-mûh, "Water people," whose legendary history is quite strong that they came from the south. I only know at present that there are traces or tracks of the

* See Bandelier in *Journal of American Ethnology and Archaeology*, vol. iii.



PLATE IV.—Human figure with snake mask (after Codex Cortesianus).

same mythological system and symbolism among them and the aborigines of Central America,* and that the relationship between them and the Zuni and other Pueblos is most intimate. Their ceremonials are not always identical, as the same observances in the different villages are not the same in details. If we can trust their legends, their kinship with the other Pueblos is of the most intimate kind.†

EXPLANATION OF PLATE I.

The Atamalqualizti.

(The identification of the figures was made for me by Dr. Seler,‡ and the following explanations are translations from the German text :)

1. The masked dancers.
2. Rain Gods on the top of a wind mountain.
3. The eight years (interval in which the ceremony occurs).
4. The *Cu*, temple.
5. The weeping old men and women with baskets full of pastry.
6. Leading Mexicans clad in gala costume (for the dance).
7. Women bringing offerings.
8. Water with snakes and frogs.
9. The Maçatecatl swallowing a snake.
10. Macuilxochitl, god of play and dance.
11. Xilonen (?) goddess of the early corn.
12. Pahtecatl, the pulque god.
13. Tlaloc, rain god.
14. Chalchiuhtlicue, goddess of flowing water.
15. Ixtlilton, god of health-giving water.

* See remarks by Bandelier, Final Report of Investigations among the Indians of the Southwestern United States, etc. Archæol. Inst. Papers, Am. series, iv, pp. 586-591.

† According to Stephen's account (see Mindeleff, A Study of Pueblo Architecture) the Asa people came from as far east as the Rio Grande, stopping at different pueblos in their migrations. They brought their cult with them, became amalgamated with the Snake people, who came from the north and west.

‡ The author knows next to nothing of the symbolic characters of the Mexican deities and is not responsible for the identifications introduced in the explanations of the plate; he has simply translated Dr. Seler's text.

16. Xochiquetzal, goddess of female manual and artistic fabrications.
17. Tezcatlipoca.
18. Tezcacvac aiopechtli, an earth goddess.
19. Ixcoçauhqui, god of fire.
20. Ciuacouatl, earth goddess.
(The author has spoken of other identifications in the text.
21. The five Tlaloc, the five rain gods.

The legend at the bottom of Pl. I, "Mexican Rain Ceremony," may seem an improper one, as nothing is said in Sahagun of its being connected with rain-making, and another object for the festival is distinctly stated. The predominance given to the Rain Gods, Tlaloc, "in whose honor they danced," and other reasons of a comparative nature have led to the adoption of the legend.—J. W. F.

THE PHYSICAL ANTHROPOLOGY OF THE FUEGIANS.— Dr. Rudolf Martin, of the University of Zurich, has an exhaustive study on this subject in the *Archiv für Anthropologie*; based upon 21 skeletons, 58 skulls, and a considerable number of preparations of muscles, viscera, etc. The race is of short stature, with reddish-brown skin, straight, black hair, and small, dark-brown eyes. Their skulls are mesocephalic, brachyfacial, with narrow, retreating brow, and a slight sagittal crest. The lumbar curve is slight, the upper extremity relatively long when compared with the lower. They are undoubtedly of the American type, differing, however, from their neighbors, the Patagonians, Araucanians, and Pampas Indians, while resembling, more or less, the Botocudos, Tapuios, Guarani, and Aymara. They show also a certain resemblance to the fossil race of Lagoa Santa, and the hypothesis of Donikers, that these widely separated tribes are relics of a former race that inhabited the continent before the present stocks, appears probable.

As to affinities with foreign races, Dr. Martin holds that it is not to the Mongols, to Japan, or to the Polynesian islands that we should look, but rather to Europe. The crania appear to show relationships with the oldest type known, the quaternary skulls of Neanderthal and Spy. He points out that geologic and phytogeographic evidence show that in Eocene times the continents were connected by a strip of land through Iceland and Greenland.

No certain deductions can, however, be made until careful examinations are made of the other ethnic aboriginal groups.

ON THE EVOLUTION OF THE ART OF WORKING IN STONE.

A Preliminary Paper.

BY J. D. MC GUIRE.

Heretofore the great stages of culture of man in Europe as well as in parts of Asia and Africa have been designated as those of stone, bronze, and iron, whereas in America and Oceanica man is supposed not to have progressed beyond the pure stone age. There is, however, evidence of some use of bronze in South America prior to the advent of the discoverers of the continent.

The stone age of the world has been almost universally supposed to have been divided into two distinct periods: the one an age in which man used only rude chipped implements, and the other an age in which man chiefly used polished implements.

The paleolithic period has been asserted to have continued from man's first use of stone as a weapon or tool—supposed to be somewhere in a geologic age earlier than that in which we live—on through a vast and indeterminate time when only stones that were rudely chipped were employed, to that comparatively modern period when it is supposed man first learned the art of polishing his implements. The evidences of this first period of man's development as an intellectual creature are said to be discoverable only in the gravel beds, in the loess or in the lower strata of caves, associated with the bones of a fauna now nearly or entirely extinct.

The neolithic period, on the other hand, is asserted to be that age where man had advanced to a knowledge of the art of polishing his implements as distinguished from the art of chipping them, which has generally been considered as a clear evidence of wonderful improvement. As might naturally be expected, great difficulty has arisen in distinguishing articles from a given locality as belonging to the one or other of these ages. From the great similarity existing between a number of "finds" heretofore made in America, and European specimens from analogous strata, the same conditions are supposed to have existed in America as are believed to have

occurred in Europe. There is no good reason why evidences of man's ancient existence should not be found in America as elsewhere. Taking the type of the implement as a criterion of antiquity, America, Europe and Asia stand on the same footing. It is proposed to discuss the data for a belief in the existence of distinctive paleolithic man in Europe and America without reference to the other great geographical subdivisions.

Doubt has recently been expressed as to the value of American gravel finds as establishing an era of "chipped" stone on this continent. The "paleoliths" of the Trenton gravel found on or near the Delaware river, as well as those found at the Little Falls on the Mississippi, are claimed by Professor W. H. Holmes, whose views are sustained by many well-known geologists, to belong to the talus of the rivers' banks, or, if found on the plateaus above, to be so near the surface as not to be necessarily of great age, and are shown to be similar in every particular to rejected material found in aboriginal quarries worked by American Indians in comparatively recent times.

Dr. Abbott, Professor Wright, Professor Haynes, and others combat the views of Professor Holmes. Discoveries in the gravels and caves of Europe of stone implements associated with the bones of extinct animals have been so often recorded, and by men of such probity and recognized ability as to place the fact of their occurrence beyond contradiction, so far at least as that country is concerned. The contents of American gravels are so little known that it may be argued that there are not at present sufficient data upon which to predicate an intelligent opinion as to the contemporaneity of man with extinct animals upon this continent. The contents of American caves are as yet unknown, none, so far as the writer is informed, ever having been thoroughly examined, so that no assertions as to what they may develop can amount to more than surmise.

The similarity of much of the American quarry refuse with the European paleoliths is very striking. The character and size of the chips detached appear identical, as do the so-called implements, when laid one beside the other. It is claimed by the writer that, judging this question from a purely archeological standpoint, the paleoliths of Europe and the similar American implements are in all particulars identical and are the productions of man existing under like conditions.

The writer expects to show that among the best-known authors

on European archeology there is no unanimity of opinion as to the status of the chipped stone age, and it will be further argued that, all things considered, the weight of authority is against the existence of any considerable period of time in which man lived, either in Europe or America, when his only implements were those which were chipped. This opinion is advanced with all due deference to the views of the large class who differ from it and without in any sense calling in question the great value of the opinion of geologists, prehistoric archeologists, anatomists, and those who believe in the evolution of man from the lower orders of the animal kingdom.

The theories here advanced as being worthy of some consideration in forming an opinion on the probable development of stone implements are based chiefly on a series of experiments made during the last two years to ascertain the aboriginal methods of working stone. These experiments seem to demonstrate satisfactorily how man fashioned his implements and to give a basis upon which to form an opinion that is of value. In fact, it is believed that by means of these experiments some of the aboriginal methods employed in fashioning tools of stone have finally been ascertained.

The writer has for more than twenty years been collecting stone implements, and has also some knowledge of what has been written on the subject in both Europe and America, and has not been unmindful that there are many data contained in the works written by travelers among races living under primitive conditions that throw light upon archeological matters. The accuracy of the theory of chipped and polished stone ages was for many years accepted by him without question because of the supposed unanimity of opinion on the subject expressed among archeologists. An active experience of two years' almost constant work in an endeavor to reproduce aboriginal methods of work, chiefly in stone, with tools of stone, wood, and bone, such as are found in the village sites in America and Europe, as well as with tools found in graves and those used by races living in low stages of savagery, and also with methods of work described by travelers in America and elsewhere, has, however, had a tendency to raise doubts where formerly there were none, and to simplify much that had appeared difficult. These doubts have in many instances resulted in conviction that much that has heretofore been accepted as being beyond question in regard to stone implements has been based on erroneous data and is open to serious criticism.

An examination of any local collection of artificial stone of any period will, it is thought, convince the investigator, if he be well acquainted with the minerals of the locality in which the collection was made, that those who fashioned these implements not only knew the stones of the particular vicinity, but that they were acquainted with their fracture and adaptability to a given purpose, whether that purpose was to grind, batter or *chip them into shape*. Almost any mineral may be ground, many can readily be battered but cannot be chipped; others may be readily chipped, but are destroyed in the attempt to batter them into form. On examination it is found that every rock has been worked in the best and most economical method which its texture admits.

A careful examination of any stone tool will readily show the method pursued in fashioning it, and it will be found that it was ground, battered or chipped, or that there was a combination of these processes for the same implement. The striæ produced by grinding often indicate the method of work. The composition of the stone, if ground, will often be of value in demonstrating whether battering or chipping preceded grinding. In chipped implements the size of the spalls will often show whether percussion or flaking was used, and upon occasion a magnifying glass will be found of great value in demonstrating minutiae of work not readily distinguishable by the unaided eye.

Every day's work performed by the writer in working stone has added to the conviction that a person capable of chipping out a paleolith would, after at most a year or two spent in such manipulation, have acquired the skill requisite to batter an implement into shape, and subsequently, if necessary, to grind a blade to it in order to make it more serviceable and symmetrical. This view, if correct, would do away with the alleged differences in the paleolithic and neolithic periods, the terms first applied by Sir John Lubbock to distinguish the earlier from the later stone age. On the contrary, however, one might be an expert in grinding and battering stone, the simplest of processes, without ever recognizing or appreciating the value of chipping stone into form, which is one of the most difficult of methods known, and requires more skill, and a more intimate knowledge of the cleavage and fracture of minerals than any known to or practiced by savage man. And from the known methods pursued in producing chipped or battered and polished implements, the writer is convinced that the art of chipping, being so

much more difficult than battering and grinding, is a later acquirement.

Does there appear any great difference in the characteristic work of battering, grinding, and chipping when regarded merely from a mechanical standpoint? Can one be in great doubt as to which process required the greatest amount of intellectual thought? Any one familiar with river pebbles will recall that outline forms of the so-called celt are generally present in the gravels of rivers or streams having a rapid fall; forms which are due to abrasion. These celt-like forms only require slight grinding at their broader ends to make superior implements. The river becomes a teacher whose lesson, the writer is forced to think, would be quickly learned even by a savage.

Battering one stone with another is among the first arts that man, even in the lowest stages of savagery, would be likely to discover, for if he ate nuts or cracked bones or crushed roots he would of necessity perform the work by means of placing the object on one stone and crushing it with another, and in most stones the operation of obtaining nuts sufficient for a meal would of necessity wear a cavity which would increase in proportion to its use, and such a lesson would not fail to be learned and profited by when necessity arose to fashion any desired form of implement. Chipping, on the contrary, is one of the most difficult of labors to perform with success. Even in comparatively modern times we learn that the art of chipping gun-flints was confined almost entirely to English artisans, and although suitable material for such flints abounds throughout Europe, the governments of the Continent at one time sent workmen to England to learn the art. Quartz and quartzite are even more difficult to chip than flint, for the stone is more refractory, and a careless blow given at an improper angle is sure to destroy the object intended to be fashioned. It is reasonable to suppose, when the different methods are understood, that man first learned the simpler art and later the more complicated, and it seems hard to believe that he lived for many centuries in ignorance of the simpler one that nature was performing daily in every stream under his eye and which he was himself performing constantly for other purposes, but learned one more complex and unfamiliar. Experience, as well as *a priori* reasoning, teaches that the art of grinding and battering stone must have preceded that of chipping.

Arrow-points and spear-heads may be made, as shown in Fig. 1, by setting the stone from which it is intended to fashion the implement on another stone and beating the edge of the implement with a stone hammer, by which method a fairly good blade may be produced. Professor Holmes has shown that the boulders in the Piney Branch workshop may be chipped by freehand percussion. There are, however, on this site boulders too large to work by any such process, many of them weighing fifty pounds or more. The writer, in an experience of several days at this place, found it impossible

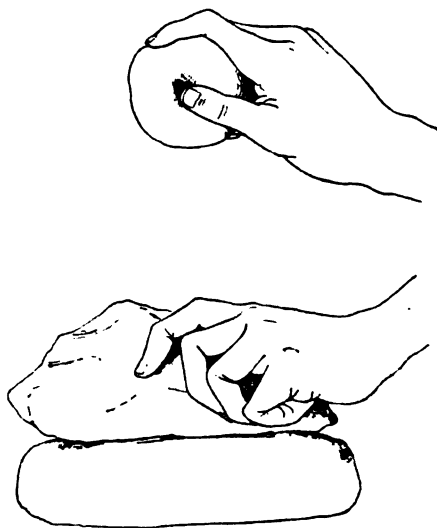


FIG. 1.

by the Holmes method to break many of the large stones lying on the surface, and even with the smaller pebbles found freehand percussion an unsatisfactory way of splitting them. The jar to the muscles of both arms is so severe in chipping whole pebbles as to persuade one against the theory that such a method was adopted by the Indians. An examination of those pebbles from which only two or three spalls have been detached convinces the writer that the first process at Piney Branch was to split the pebble open by hammering it between two stones, using a hand hammer for small boulders, and a small hammer with a flexible handle to detach spalls from the larger ones. The stone, being broken in a suitable man-

ner, was dressed down by a combination of the method shown in Fig. 1 and that suggested by Holmes, but the two combined explain the process to a certain extent only, for neither of these methods produces the perfect leaf-shaped implement. Were the objects in the Piney Branch workshop the production of "turtle-backs," why is it that we find so many thousands of stones yet lying on the surface of the hill, which a dozen blows would make perfect implements? On the other hand, we find in the same place but little material left from which flakes of sufficient size may be obtained from which to produce good blades, although there is abundant evi-

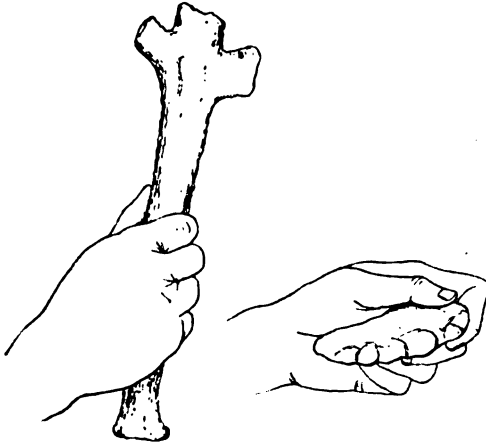


FIG. 2.

dence that much of such material has been removed. The pebble being split open as indicated, one of the best methods then to pursue is to chip the stone into its desired outline with a deer-horn hammer, such as is still used by the natives of parts of Alaska. (Fig. 2.) This implement, for such a purpose, is easily held in the hand, and produces most satisfactory results with but slight exertion of force. To complete such an implement, however, the notched bone, punch, and flaking-tool were one or all used.

By whatever method the chipping was done, it must be admitted that it is one of the most difficult arts known to man.

According to Sir John Lubbock, the fauna of the paleolithic age comprised the mammoth, woolly rhinoceros, urus, cave-bear,

musk-ox, etc., and man in that period is asserted to have been ignorant of the use of pottery and metal. The same distinguished author also asserts that out of 30,000 worked flints of Claleux and Furfooz not one presented a trace of polish, yet Southall asserts that pottery was found at Nibrigas, associated with a skull of the cave-bear, and at Engis cave, in Belgium, associated with the bones of the rhinoceros. According to Joly, M. de Bize found at Bize, in Aude, and M. de Christol, at Sauvignargues, in Gardes, fragments of pottery that it is scarcely possible not to consider contemporaneous with the reindeer and perhaps with the cave-bear, with whose remains they were found. Joly found pottery in a bear cave at Nabrigas, in Lozère, and M. Ferry at Vergisson, near Maçon. M. Dupont, in Belgium, found rude pottery associated with the bones of the mammoth and rhinoceros in the Trou Magrite, and says: "All the dwelling places of our indigenous ancestors contained fragments of very rough pottery."

MM. de Puydt and Lohest found in the grotto of La Biche aux Roches near Spy, in the province of Namur, a cavern which showed no evidence of having ever been disturbed. The first layer, 1.^m60, of broken-down argillite produced a recent skull. The second layer, 0.^m80, a tufa of bones, produced *Elephas primigenius*, *Cervus canadensis* (?), and flint chipped generally on one side, of the Mousterian type. The third layer, 0.^m30 in thickness, produced *Rhinoceros tichorhinus*, *Cervus elaphus*, the teeth of a large species of *Felidæ*, and bones that are supposed to belong to *Elephas antiquus*, Mousterian implements; a bone baton of command, a hollow bone containing oligiste (ochre?) powdered, several little ivory plates of mammoth tusk representing seals, resembling a worked stone from a mound in Vermont, and three fragments of burned pottery. The fourth layer, 0.^m40, produced two human skeletons, three Mousterian points, bits of ivory and bones supposed to be similar to the layer above.

M. Albert Gaudry describes a baton of command beautifully carved with animals, with a large hole bored through it, found in the grotto of Montgaudier in the same layer with *Felis spelæus*, *Ursus spelæus* (?), *Rhinoceros tichorhinus*, and pieces of worked ivory of mammoth tusk. In almost all of these caves are found bone needles with bored eyes.

According to Schliemann, what he, Professors Lindenschmidt and Virchow, M. Burnouf, and Dr. Nicolucci call corn-bruisers, or

ancient millstones, are found in the caves of the Dordogne. These so-called corn-bruisers, according to Lartet and Christy's book, "*Reliquiæ Aquitanicæ*," are what are known to American archeologists as pitted hand-hammers, and were found in the caves of Les Eyzies, La Madeleine, Gorge D'Enfer, and Laugerie Basse.

Lubbock and others place the Danish kitchen heaps in the Neolithic age, while Sophus Miller speaks of the chisels there found as belonging to the earliest period of man. Pottery is asserted to belong to the neolithic period, yet numerous authors have found it associated with an early cave fauna. Lartet found bored cockles and the tusk of a young *ursus* bored lengthwise in a cave near Aurignac, and Dr. Rigollot found fossils of the chalk with cavities bored in them in the gravel pits of St. Acheul. Similar instances have occurred in many localities of the finding of bored articles, pottery, and notably of pitted hand-hammers, associated with the bones of the mammalia of the drift. In Missouri it has been asserted by Dr. Koch that he found the bones of the mammoth associated with pottery, arrow and lance heads, axes, and ashes. All over the world we find early man to have lived in an identical manner, using similar tools, and struggling with the wild beasts for the possession of caves to shelter them from the inclemency of the weather. The absence of celts from the drift and of implements of the drift type from tumuli is used as an argument to sustain the different ages of stone, yet the American workshops present to us the true paleolithic type of implement, and from the hundreds of thousands of tons found within eight feet of the surface in one or another locality, it may be doubted whether a single polished implement could be found. The character of work performed upon such a site would make it improbable that polished implements would be likely to occur there, upon the same principle that the extensive steatite quarries found along the Atlantic seaboard (which were worked by the aborigines within the historic period) are, so far as the writer is aware, totally without pottery, arrow-points, or spear-heads. In large districts of Europe flint is everywhere abundant and of a cleavage suitable for the manufacture of most chipped tools, and as a consequence quarries would not be expected to occur. In America material suitable for chipping occurs only in isolated localities, and those places are found to abound in workshops. If the flint in Europe is of varying quality we may reasonably expect to locate similar sites even there.

One great argument in favor of paleolithic man in Europe is the

absence of his implements from the tumuli. If the writer's views are correct the paleolith could in no sense be an article likely to be found in such places, where only completed implements would be deposited to serve the spirit in its journey to another world. The absence of unfinished implements from burial places is as marked in America as it is in Europe.

The average paleolith serves no purpose either as a fighting or as a working tool that could not be materially improved by one capable of fashioning the paleolith. It is argued that man was at so low a stage of culture as not to have sufficient intelligence to improve the shapes of implements, but that he imitated them through generations. Admitting the imitation, would not an improvement fashioned by accident be reproduced when found to be superior to the ruder tool?

It is not even possible that these sole evidences of paleolithic man have survived because they were the only ones fashioned from imperishable material?

Pottery could not exist in the drift, for although practically indestructible in a dry soil or climate, it lasts at most but a few months when exposed to water in motion. Not only would pottery be destroyed in this manner, but the bones of most animals would fare the same fate when exposed to the grinding and crushing of gravel in process of deposition. The gravel or small boulders of a river's bed are found to be composed almost entirely of quartzites and the harder stones, although the country through which the river flows may be composed largely of limestones and similar minerals. Owing greatly to the grinding process of the floods, the softer material becomes mud and sand, even the hardest being ground to small dimensions.

The opinions entertained by the classical Greek and Roman writers, that man in his first stage was but just removed from the brutes, accords singularly with the train of thought which the modern doctrine, according to Lyell, has developed; yet our knowledge of earliest implement-making man shows that he was a being endowed with intelligence by which he was from the outset enabled to crown himself their master, to employ their carcasses for food and their skins for clothing, and to fashion implements of stone, etc., by means of which he could maintain his supremacy over them for all time. That in the beginning his tools were rude and his existence precarious; that he had no fire; that he struggled with the bears and other wild beasts for the shelter afforded by caves to protect him from the in-

clemency of the weather, may be true ; is there, however, substantial evidence that he lived through periods of time that can only be counted by many centuries, struggled with a fauna that became extinct before he had learned the art of grinding an edge to a stone, or working a rough block of mineral into a smooth one? That such a view can be successfully maintained must be doubted. The implements of the drift and of caves are, as a rule, of flint, a material that lends itself peculiarly to the chipping hammer, to bone hammers, to pressure, to grinding, and probably to other simple methods of detaching its flakes and thus giving it almost any desired form in the hands of even an amateur in chipping. But implements of flint, it may safely be said, are never found that have been battered into form ; for this material, when struck a severe blow upon a flat surface by even a bone hammer, breaks across with a straight or nearly straight fracture. It is so compact in structure, and of such hardness, that specimens are rarely, if ever, found that have been bored.

In chipping something more is necessary than merely striking one stone against another. All chipped implements show a special fracture ; the weight of the hammer, its material, and its shape are all important elements to be considered ; the intended implement must be struck with a certain weight and force and at a particular angle to accomplish the desired result. The quarry hammer of great weight must be used if it is desired to crush a large block of stone ; the hand hammer, to reduce it still further. Often possibly a set or punch and hammer or pressure alone may be used to accomplish the same purpose ; then again a light bone hammer may be used to give uniformity to edges left rough by the hand hammer or to detach flakes from a brittle material. Again, in chipping, when a lump presents itself that cannot be readily detached, the intended implement would often be set edgewise on another stone, and by striking a vertical blow with a chipping hammer the lump would be detached, enabling the punch or flaking tool to complete the process without further trouble. As a finishing process, the bone flaking tool would be used. These various stages of the evolution of a block of stone into the completed tool may be recognized with some degree of accuracy, even among so-called paleoliths. The hand hammer used in chipping requires weight and hardness to facilitate the detaching of flakes, but any ordinarily hard stone that may be readily held in the hand will answer the purpose. In chipping stone the blow must be carefully calculated

and its point of impact considered with a view to the chip which it is desired to detach, for a careless blow greatly endangers the safety of the implement. Whilst we cannot, with our present information, describe the precise method of fashioning a chipped implement from the time the original block of stone is attacked until the tool is finished, we can say with some degree of positiveness that the method is a complicated one.

That man may have existed for a great length of time without any implements is possible. Should we not, however, in arguing such a question, confine ourselves to available data without resorting to surmise? The most reasonable supposition in regard to the purpose of the many work-shops located in America appears to be, that they were the sources of supply from which the natives of a given locality obtained raw material to fashion subsequently into arrow and spear heads. In these localities they would lay in rudely shaped tools that were of a character that enabled them to remove the greatest amount of material with the least inconvenience. This supposition is sustained by the many finds of caches of lanceolate blades found all over America and even in Europe, attention to which was first called by Mr. W. H. Holmes.

The battering hammer is commonly a discoidal stone, having a rounded periphery, with a pit on each flat surface intended to hold the thumb and middle finger, whilst the index finger is placed on the periphery. The pits are but slight depressions, but are sufficient to prevent the stone from slipping as the blow is given, and at the same time enable the workman to raise the index finger slightly, and thus save the jar which would otherwise in a few minutes disable the arm. The blows with the battering hammer are given at the rate of two hundred or more a minute, which would be impossible with the ordinary chipping hammer. With this hammer rapidity is essential, and the blow is ordinarily given to a broad surface, and no deliberation is necessary. Battered objects are numerous and vary greatly in size; consequently the hammer is found to vary likewise. In America it is, as a rule, of quartzite, but not always so, being varied to some extent according to the material to be worked. If the implement to be fashioned was of indurated clay, any harder stone would be suitable as a hammer; if, however, a jadeite was to be fashioned, the hammer would be of like material, of jasper or some equally hard stone. Such hammers appear to be found all over the world and from the surface down to the lowest strata of the caves. They are common in the

débris of the bottom city of Troy, fifty-two feet below the present surface, and are also found in the oldest lake dwellings and among the most ancient remains of all countries. It is probably more generally distributed than any other implement of which we have knowledge. How is this implement to be accounted for in the caves unless it were put to its natural use as a battering tool? That chipping can be done with it is true, but why make in an implement pits for which there is no need, and which if intended for chipping would really interfere with the work to be performed? The flattened sides, by reducing the weight of the hammer, would decrease the efficiency of the tool. Even the worn surface or periphery of these hammers, caused by being used to rub down the pecked surface, is often observable on specimens in America and Europe, and particularly at the site of Troy—in fact wherever the remains of man are found; and it is believed that this rubbed surface will be found wherever this class of tool is met with, whether in caves, shell heaps, lake dwellings, burials of all ages, or among the sculptures of America, Europe, Asia, or Africa. It was beyond doubt the great carving tool of antiquity, from the period when man first learned the art of carving stone on through the ages so long as hard stone was fashioned, and was only displaced by the discovery of the art of making steel.

We find, therefore, that there are evidences that man, as early as we have any knowledge of him, possessed the typical implement with which he could best batter and grind stone. He had knives with which he could cut various articles and needles with which to sew; he knew the art of making and burning pottery; could and did make fire; he drilled holes of large and small size in bones, antlers, shells, and fossils, and was familiar with the art of engraving at a period contemporaneous with the Mousterian implement and a quaternary fauna. With such evidences, can it be argued that man was ignorant of a knowledge of the process by which stone was battered and ground into shape and yet familiar with the more difficult and complicated art of chipping?

The writer has by experiment demonstrated the simplicity of the methods by which neolithic implements were fashioned, and has shown that what was supposed to require years to complete was in reality but the work of a few hours. The references herein given could be greatly increased were it necessary, but it is considered that sufficient data from the best sources have been given to show the error of the paleolithic hypothesis.

CRANIAL DEFORMITIES IN TOULOUSE.—M. le Dr. J. Ambialet, Procureur à la Faculté de Médecine de Toulouse, furnishes to *L'Anthropologie* of Paris a study of the artificial cranial deformities in Toulouse, which Broca and Dr. Delisle have before made known. They are produced by the *serre-tête* and a *bandeau* applied to the head of the new-born, and often worn by the women during their entire lives or replaced by other coiffures, viz., the "*sarradisso* and *foulard*," (the former a kind of close-fitting hood, the latter a handkerchief, held in place by a *bandeau*), which, by their constriction, prevent the return of the cranium to the state normal to it before it was deformed by the *serre-tête*.

Two types of deformities are produced, a horizontal and an oblique, according as the line of application of the constrictors approaches the horizontal or the vertical plane; each of these types again presenting varieties, the horizontal may be exaggerated, or slightly exaggerated, and the oblique may be oval, ascending cylindrical, or bilobed cylindrical. The deformation interferes with the symmetrical development of the cranial arch.

The numerous measurements taken enable Dr. Ambialet to advance three conclusions:

First. That the Toulousian is brachycephalic and mesaticephalic.

Second. That in the young generation the brachycephalic type tends to replace the mesaticephalic.

Third. That dolichocephalic and mesaticephalic crania are often due to constriction.

The Toulousian cranial deformation tends to produce dolichocephaly; and of forty cases observed in the very aged and adult classes, thirty-five are extremely deformed. Of eighty-eight mesaticephalic cases, fifty-seven presented deformations varying in degree, and in eighty-three brachycephalic cases, only four bore traces of the *bandeau*. The mesaticephalic Toulousians examined had very marked bregmatic depressions. The mechanism of the compression and of the consecutive cranial compensation furnishes the explanation of these varieties of conformation found in the horizontal type and called the "exaggerated," and in the oblique type and called the "ascending cylindrical."

As to the crania of the "oval" variety, they are generally mesaticephalic; nevertheless, they may be brachycephalic.

FURTHER NOTES ON INDIAN CHILD-LANGUAGE.

BY A. F. CHAMBERLAIN.

Since the article "Notes on Indian Child-Language" (AMER. ANTHROP., III, 237-341) appeared, the writer has had occasion to further consider the subject, and a few additional notes are here presented.

To the child-words cited from Cuoq's "Lexique de la Langue Algonquine" are to be added:

Ba, terme par lequel les jeunes enfants expriment leur désir de recevoir ou de donner un baiser (p. 75).

Op, mot enfantin pour exprimer le désir de se lever, de sortir du berceau (p. 307).

Baraga, in his "Dictionary of the Otchipwe Language,"* gives the following children's words:

Bobo, little pain, little wound (in the language of children), p. 93.

Ioio, pain (in the language of children), p. 157.

Kaka, or *kakash*. They say this word to children to express that s. th. is bad or dirty (p. 179).

The word *E* or *Enh!* is given by Baraga (p. 112) as an ordinary interjection = "yes," and not a special child-word.

Ioio seems to be the reduplication of the interjection *io!* = "ah! oh! (expression of pain or ache)."

Mr. Horatio Hale† was kind enough, in connection with the previous article, to furnish me with the following extract from a letter received by him from the Abbé Cuoq, in response to an inquiry relative to the "child-words" given in the "Lexique de la Langue Iroquoise":

"Pour ce qui concerne en particulier la tribu des Iroquois, il est certain que ce langage a cours dans toutes les familles, que les parents, surtout les mères, l'apprennent à leurs enfants, et que ceux-ci ne font que répéter en suite les quelques mots dont il se compose."

* Part II, Otchipwe-English, new ed., Montreal, 1880.

† Letter to the writer of these notes, under date of July 9, 1890.

The Abbé, Mr. Hale adds, remarks that he "could not explain why the labial letters, which the Iroquois usually have much difficulty in pronouncing, should be used in this 'langage enfantin.'"

In the "Vocabularies of the Tlingit, Haida and Tsimshian Languages," published by Dr. Franz Boaz,* the following child-words, with their equivalents in the speech of adults, are given :

HAIDA CHILD-WORD.

gedě's

tsō'ū

ADULTS' WORD.

gyit = Doll (p. 186).

kā'u = Female sexual organs (p. 187).

Dr. Karl von den Steinen, in his recent work on the Bakairié language of South America, includes the following child-words :

BAKAIRI' CHILD-WORD.

tsō'go, tso'yu

s'eko

tágo, tákxo

n'iyō, n'igo

ts'ego

tségo

ADULTS' WORD.

iyume = Father.

i'sē = Mother.

itámu = Grandfather.

inū'tu = Grandmother.

i'se = Mother's sister.

yop'ūri = Father's sister.

Of these words *tsō'go* (= *tsō'go*, patruus, in the speech of adults) seems related to *Kxúyu*, *Kxúyo* (*matruus*, in speech of adults), and *tségo*, *séko*, may be, as von den Steinen suggests, connected with *i'se*.

Amongst the Kootenays, of southeastern British Columbia, the only child-word met with by the writer is *papā*, which is used for "father," instead of *tiō'nām* (used by men) and *sō'nām* (used by women).

BLOOD CEMENT USED BY THE ANCIENT HURONS.—Fr. Gabriel Sagard, in his "Le Grand Voyage du Pays des Hurons" (tome I, page 189, 1636), says that these Indians with small, sharp stones extracted blood from their arms to be used to mend and glue together their broken clay pipes or pipe bowls (pippes ou petunoirs), "which is a very good device, all the more admirable, since the pieces so mended are stronger than they were before."

J. B. N. HEWITT.

* Proc. Amer. Philos. Soc., 1891, pp. 173-208.

PREHISTORIC IRRIGATION IN ARIZONA.*

BY F. W. HODGE.

In none of the extensive archeologic remains of southern Arizona are the industry, perseverance, and degree of advancement of a large pueblo population more faithfully illustrated than in the many works of irrigation that abound in the valleys and on the mountain slopes of this section. Prior to the prosecution of systematic archeologic investigation in this region, it was generally believed that, aside from the employment of catch-basins or rude reservoirs formed at the bases of mountain arroyos, artificial irrigation was not practiced by ancient pueblo builders, and that the existing pueblo tribes derived from the early Spanish missionaries or conquistadores their knowledge of conducting the water from the streams to their fields. In the valleys of the Salado and Gila, in southern Arizona, however, casual observation is sufficient to demonstrate that the ancient inhabitants engaged in agriculture by artificial irrigation to a vast extent.

The arable area of the valley of the Salado comprises about 450,000 acres, a tract almost equally divided by the river. No obstacle is encountered in irrigating the land lying south of the stream for a distance of ten miles, but greater difficulty attended the conducting of water to the northern area by reason of the greater slope of the land, which necessitated the establishment of headworks much farther up the river. This difficulty modern ranchmen have overcome by the construction of the Arizona canal, which traverses a distance of forty-one miles from east to west, and has a capacity of 40,000 miners' inches, sufficient to irrigate 50,000 acres, or over 27 per cent. of the 182,000 acres now reclaimed by the nine irrigating canals of the valley. This latter area is less than one-half the lands redeemable by the waters of the lower Rio Salado.

Judging from the remains of extensive ancient works of irrigation, many of which may still be seen passing through tracts cultivated

* From notes made in 1887-'88 while the author was a member of the Hemenway Archeological Expedition, operating in the Southwest under the directorship of Mr. Frank Hamilton Cushing.

to-day as well as across densely wooded stretches considerably beyond the present non-irrigated area, it is safe to say that the principal canals constructed and used by the ancient inhabitants of the Salado valley controlled the irrigation of at least 250,000 acres, even without considering the economical methods employed by a primitive people in all its undertakings.

The mode of canal construction employed by these pueblo builders was another indication of their patience and industry. Their canals are models for the modern farmer to imitate; yet they could have been dug in no conceivable manner save by the laborious process of hand excavation with stone or wooden implements, the earth being borne away by means of blankets, baskets, or rude litters. Notwithstanding this, the outlines of at least a hundred and fifty miles of ancient main irrigating ditches may be readily traced, some of which meander southward from the river a distance of fourteen miles.

In following the courses of these canals their depressions may more readily be seen in the dense mesquite forests, where protection is afforded against the drifting sand. On more open ground their routes are generally entirely effaced, lines of stones alone remaining to mark their sites. These stones were the implements once used, broken, and cast aside upon the banks, as well as concretions grotesquely eroded by the river stream and deposited by the natives along the banks as "tamers of the waters." Similar concretions or huacas, according to the description by Mr. Cushing in his article on "Zufi Breadstuffs," are placed by the Zufis along the courses of hill-streams near their main pueblo and along the ditches of Pescado and Ojo Caliente, in order, presumably, to direct the waters of the rainy season from the hillsides to the thirsty fields, and to prevent the overflow of their acequias. It is interesting to note that in no instance were these concretions found to have been used as implements, although many of them are admirably adapted to such purposes; a fact further attesting their sacred character.

In the progress of the investigations of the Hemenway Expedition in the Salado valley, under the directorship of Mr. Cushing, excavation was undertaken at a point along the course of one of the principal supply canals of the ancient Pueblo de Los Muertos, near one of the thirty-six large communal structures which formed this now ruined city, and extended for a distance of about thirty feet. The depth of the bed beneath the original banks was found

to be about seven feet. Unlike ordinary irrigation ditches, these were constructed in such a manner as to control to some extent the depth of the current as well as to prevent waste through seepage. The bed of the canal was about four feet wide, but the sides broadened in their ascent to within about four feet of the bank, where a "bench" three feet in width on each side of the canal had been made. From these benches the banks continued, broadening until they reached the brinks, which were about thirty feet wide. Thus a main ditch consisted, so to speak, of one water-course within another; so that if at any time a small current of water only could be supplied at the headgate, owing, perhaps, to drouth, the lower and narrower ditch was doubtless always filled sufficiently to supply the towns beyond, while during the rainy season the upper and much broader portion of the great canal would readily accommodate all surplus waters.

The bottom and sides of the irrigating ditch which was opened, as well as those of a branch of it excavated to the southwest of the ruined-house cluster alluded to, were found to be exceedingly hard, evidently having been tamped while moist, and then, perhaps, roughly plastered with adobe clay. The extreme hardness of the canal lining may be accounted for by the supposition that, instead of burning the dense underbrush for the sole purpose of destroying it, the natives gathered it into their moist canal beds, where it was burned to harden the newly plastered lining. Very little silt was found in the beds of the irrigating ditches, a fact exhibiting either the care taken of them or showing that a current of considerable strength was flowing at the time of the abandonment of the pueblo.

A few rods south of the canal excavation referred to, the canal was observed, from the course of the chipping stones and concretions or "water-tamers" along its banks, to decrease in width and branch off into two canals, each at an angle of about 45° from the trunk acequia. Excavation at this point showed a number of post-holes on the outer banks of the two branches, as well as at the angle formed by their juncture, attesting the former existence of a head-gate for cutting off or supplying at pleasure the farm lands and house groups to the southward.

The only specimens collected from the canal excavation were a few potsherds, quite a large quantity of cottonwood pollen comparatively well preserved, a few small fresh-water univalves, and the remains of a bundle of fagots or reeds that had apparently floated

down with the current. The finding of these last-mentioned remains suggested the possibility of the irrigating canals having also been used in conducting a rude system of navigation by means of *balsas* or cane rafts, in transporting bowlders and other material from the river to be manufactured into cutting and chipping tools, etc. It was also observed that all the unfinished stone implements found at Los Muertos (except the lamelliform tools of shale or slate, such as knives and hoes), whether of diorite, granite, or sandstone, were smoothly water-worn, and consequently the products of the river-bed nine or ten miles distant, and were not conveyed from the Maricopa mountains, situated only about five miles to the westward.

The existence of these thousands of water-worn tool-stones and the absence of the ill-shaped fragments of basalt from the mountains, however, is not advanced as evidence that navigation existed among these people. River cobbles are much better adapted for fashioning into implements than the rough stones found on the slopes of the basaltic Maricopa range, previously mentioned as the rock deposit nearest to the Los Muertos ruins. Therefore, notwithstanding that the difference in distance from Los Muertos to the river and to these mountains is fully four miles, river bowlders would doubtless have been procured in preference to the clumsy natural chippings from the mountains, even if the facilities for a system of water transportation were lacking. It would, therefore, not necessarily be an indication of particular advancement on the part of these people if they did construct rude craft as a means of water communication from the river to their pueblos. In fact, having exercised their ingenuity to such an extent as is exhibited by their canal construction, one would expect this next step as a matter of course, particularly where the extreme necessity for such navigation, however primitive, had arisen.

It was noted that nearly all the pueblos encountered throughout the Salado valley were situated, not near the river, as would seem more likely by reason of the convenience of such a location to stone, cottonwood timber, rushes, osiers, and other river products, but nearer the ends of the canals, where the slope of the land prevented further irrigation without the necessity of overcoming obstacles beyond the skill of such a people. In each of these cases, with but a single exception, it was observed that the tracts lying between the towns and the river were devoid of vestiges of previous pueblo set-

tlement, but, as indicated by the ramifications of the lesser canals, bore evidence of having been under cultivation.

The location of the towns usually at the farthest possible distance from the river would of itself seem to demonstrate the independence of their builders toward the source of water supply and deposits of raw material. Again, countless bowlders or cobbles were unearthed at each of the pueblos excavated, which clearly exhibited faults in chipping or flaking, and had apparently been rejected as unfit for use. Had the natives been without ready means of transportation, this rough or primary chipping of the stones would most probably have been done at or near the river rather than at the places where they were to be used, ten or twelve miles away, to which point they must necessarily be conveyed by hand.

The great distance to which these ancient canals were extended in order to utilize all the available land through which their waters coursed, the depth which they were dug, and the care taken to prevent waste by seepage, are not the only evidences of the indomitable energy of these ancient agriculturists. At the group of ruins near the Mormon settlement of Mesa City, eastward from Tempe, in Maricopa county, remains of an extensive irrigation system may be seen. Here, more than at any other point in the valley, is demonstrated the degree of skill attained. In the original excavation of the canal referred to a hill of indurated tuff was encountered, beyond which a large tract of fertile land lies. This knoll or mound of concrete was partly encircled by the irrigating ditch in order to preserve the proper incline of the canal bed, and to accomplish this it was necessary to excavate through this indurated deposit with implements of stone, a work necessarily attended with inconceivable difficulty and requiring a great length of time.

Several years ago, when the Mormons first settled at Mesa City and began the irrigation and cultivation of the fertile plain about them, they utilized this ancient canal bed for a considerable distance, including that portion encircling the knoll of volcanic tuff mentioned. The writer has been informed by one of the founders of this settlement and builders of the Mesa canal, which is nine miles in length, that the saving to them by using the ancient canal was from \$20,000 to \$25,000. To use the words of my informant: "The old canal was utilized for fully three miles to great advantage, and from one to two miles with but little benefit." In other words, one-half the modern canal occupies the ancient bed.

A number of writers, mainly in the public press, have given expression to opinion in regard to irrigation in the Salado valley by means of water stored in catchment-basins or *represas*, constructed on the various mountain slopes, in addition to irrigation by the canal system. Great stress has been laid upon this supposed irrigation by means of reservoirs in order to give color to the theory, entertained by some, of a prehistoric population in the Salado valley much more vast than possibly could have existed. Had this means of storage of rainwater for irrigation been practiced by the natives of a region so bountifully supplied with water as the Salado valley, the fact that a teeming population dwelt upon and cultivated the lands within its limits would be undeniable; but this cannot be proved to be the case, although a very large population, as Indian populations go, doubtless did occupy the greater portion of the lower valleys of both the Salado and Gila, as is shown by the extensive irrigation operations once engaged in.

Reservoirs at the mouths of mountain washes for holding in reserve rainwater for the irrigation of the lands which, on account of their elevation, could not be redeemed by the canals, are not found in the valley of the Salado. While most of the valley lands were once covered by a network of irrigating ditches, yet there were tracts capable of redemption over which it appears water was never conducted, and which could have been reclaimed by merely extending the canals, before *represas* were resorted to for irrigating the inferior land about the mountain bases.

Receptacles for the storage of rainwater occur in this region, their remains being found in many parts of the area of the lower Gila drainage, but it is safe to say that they were not constructed because of a lack of sufficient land irrigable by canals, as the low, level tracts in both the Salado and Gila valleys showing no evidence of former tillage will testify. The population of an agricultural tribe cannot well be estimated by the extent of its habitat, particularly in the arid region, but by the amount of land actually cultivated. For instance, the Zufi reserve embraces a tract over thirty miles in length, and while a large portion of it is capable of redemption and cultivation by the present water-supply, only a comparatively small quantity is tilled. Were the population of this tribe estimated by the area which embraces the scattering patches of cultivated land from Nutria to Ojo Caliente, it would reach many thousands, whereas it is but 1,600. It would appear,

therefore, that the number of inhabitants of the now dead pueblos of this region has been figured on an erroneous basis.

It seems reasonable to presume that in an arid territory like our Southwest, where so many of the streams are intermittent, the valleys of the larger streams were first occupied, and, as the population increased, the lands drained by their lesser affluents were next settled upon. As the pueblos of the Gila, as shown by their ruins, were generally larger than those of the Salado or Verde, and the irrigating canals of the former more extensive than those of its tributaries, it is not improbable that these hillside reservoirs or catchment-basins were built previously to the construction of the irrigation ditches, at a time when the population was small. Should this prove to be the case, the occurrence of these hillside reservoirs may be accounted for, since their construction might be undertaken with much less expenditure of labor and skill than the building of an irrigation canal would entail, and at the same time the wants of a small population would be supplied.

In tracing the routes once pursued by many of the canals, great depressions—the sites of ancient reservoirs—are observable. The remains of one of these reservoirs, nearly a mile long by about half a mile wide, occur on the open plain at the terminus of one of the main canals that formed the source of water-supply of Los Muertos, and about three miles southwest therefrom. It is possible that this great depression was, in part at least, a natural sink, deepened by artificial means to serve more fully the purposes of a storage basin of surplus waters from the Los Muertos irrigating system. Every cluster of communal structures in Los Muertos was supplied with a reservoir on a smaller scale than the one just mentioned, a single canal forming both its inlet and outlet. Sometimes a lesser communal dwelling shared with a neighboring structure in the water supply from a single storage basin.

Doubtless the largest reservoir within the limits of Los Muertos was that lying directly west of the ruined communal dwelling designated XIV and extending almost to its walls. A trench run through the lesser diameter of this reservoir showed its original depth to have been about fifteen feet. This artificial basin was elliptical, measured about 200 feet in length by fully 100 feet in width, and, like the canals, had apparently been tamped and burned. The bed and sides of this reservoir were covered by a thick stratum of silt.

The existence of the remains of so many extensive irrigation

works scarring the broad, level valley of the Salado seems sufficient to prove the contemporaneous occupancy of the pueblos formerly within its limits, for had a village been built and for some reason abandoned by one community, it would scarcely be in keeping with the Indian's idea of economy for subsequent settlers not to utilize the enormous labor already expended in gathering building material and digging ditches and reservoirs. While the population of these pueblo settlements was undoubtedly large, it would be unreasonable to estimate the number of inhabitants of the dozen distinct ancient pueblo settlements formerly in the valley of the Rio Salado at from 200,000 to 300,000. This, however, has been done.

THE CITIZENSHIP PRIZES.—Since the formal announcement of these was made in the last number of the *ANTHROPOLOGIST* one of the prizes has been increased and the limiting conditions have been extended.

There are now offered a first prize of \$150 and a second of \$75, to be awarded to the best two statements of the elements that go to make the most useful citizen of the United States, regardless of occupation. These prizes are open to competitors of all countries.

Each essay should be type-written or printed, should not exceed 3,000 words, and be submitted by November 1, 1893. The essays will become the property of the Anthropological Society of Washington, and may be published in the *AMERICAN ANTHROPOLOGIST* (with due credit to authors) at the option of the Board of Managers.

Each essay should bear a pseudonym or number and should be accompanied by a sealed envelope bearing the same pseudonym or number, and containing the name and address of the competitor; and the competitors' identity shall not in any way be made known to the examiners in accordance with whose findings the awards shall be made. There shall be five examiners, of whom at least one and not more than two shall be members of the Society.

It is suggested that the subject be treated scientifically, and considered from the standpoints of general anthropology, personal characteristics and habits, and of ethics.

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A QUARTERLY BIBLIOGRAPHY

OF

ANTHROPOLOGIC LITERATURE.

COMPILED BY ROBERT FLETCHER, M. D.

- Balfour** (H.) The evolution of decorative art; an essay upon its origin and development as illustrated by the art of modern races of mankind. London, 1893, Percival, 130 p. 8°. *Also*, New York, 1893, Macmillan & Co., 13 + 131 p. 12°.
- Balkwill** (F. H.) The testimony of the teeth to man's place in nature; with other essays on the doctrine of evolution. London, 1893, Kegan Paul, 236 p. 8°.
- Barrière-Flavy** (C.) Étude sur les sépultures barbares du Midi et de l'Ouest de la France. Industrie wisigothique. Toulouse, 1893, É. Privat, 35 pl. 4°.
- Blackwell** (Antoinette B.) The philosophy of individuality or the one and the many. N. Y. & Lond., 1893, G. P. Putnam's Sons, 529 p. 8°.
- Bruglière.** Ouverture du tombeau de Saint Front en 1440. Périgueux, 1892, Dordogne, 8 p. 8°.
- de Closmadeuc** (G.) Le Dolmen dit des marchands ou table de César (Locmariaker). Découvertes récentes. Vannes, 1892, Galles, 12 p. 8°.
- Fagot** (P.) Folklore du Lauragais. Quatrième partie. Albi (1892), Amalric, pp. 161-254. 8°.
- Grinnell** (George Bird). The Pawnees. Pawnee hero-stories and folktales. With notes on the origin, customs and character of the Pawnee people. New York, 1893, Scribner's Sons. 8°.
- Holmes** (William H.) Are there traces of man in the Trenton gravels? [Repr. from: J. Geol., v. I, no. 1.] Chicago, 1893, University Press, pp. 15-37. 8°.
- Liersch** (L. W.) Die linke Hand. Eine physiologische und medicinisch-praktische Abhandlung für Aerzte, Pädagogen, Berufsgenossenschaften und Versicherungs-Anstalten. Berl., 1893, R. Schoetz, 47 p. 8°.
- Michalowski** (Félix). Essai d'ethnologie préhistorique. Paris, 1893, Reiff, 24 p. 8°.
- Morse** (E. S.) A curious Aino toy. Salem, Mass., 1892 [1893], Salem Press Pub. & Print. Co. 7 p. 8°.
- Owen** (Mary Alicia). Voodoo tales, as told among the negroes of the Southwest; collected from original sources; introd. by C. Godfrey Leland. New York, 1893, G. P. Putnam's Sons, 12 + 310 p. 8°.
- Vercooutre** (A.) Origine et signification des tatouages observés sur les indigènes tunisiens. Épinal (1892), Huguenin, 5 p. 8°.
- Wilson** (T.) La période paléolithique dans l'Amérique du Nord. Paris, 1892, Leroux, 82 p. 8°.
- Abbott** (G.) Determination of the sex. Med. Rec., N. Y., 1893, xliii, 463.—**Achelis** (T.) Ueber die psychologische Bedeutung der Ethnologie.

- Internat. Arch. f. Ethnog., Leiden, 1892, v, 221-231. — **Ambialet** (J.) L'encéphale dans les crânes déformés du Toulousain. Anthropologie, Par., 1893, iv, 11-27. — **Ardu** (E.) Alcune anomalie nelle prostitute. Arch. di psichiat., etc., Torino, 1892, xiii, 569. — Sull'indice cranio-mandibolare dei delinquenti. *Ibid.*, 1893, xiv, 15-24. — **Arnaud** (F.) Sépulture sous forme de charnier encore en usage. Bull. Soc. d'anthrop. de Par., 1892, 4. s., iii, 537. — **Baldwin** (J. M.) New questions in mental chronometry. Med. Rec., N. Y., 1893, xliii, 455. — **Bassler** (A.) and **R. Virohow.** Schädel von Niassern und Dajoken. Verhandl. d. Berl. Gesellsch. f. Anthrop., 1892, 433-439. — **Batut** (L.) Du tatouage exotique et du tatouage en Europe. Arch. de l'anthrop. crim., Par., 1893, viii, 77-92. — **Beaumont** (C. W.) Human life. Nashville J. M. & S., 1893, lxxiii, 193-203. — **Belck** (W.) u. **C. F. Lehmann.** Mittheilung über weitere Ergebnisse ihrer Studien an den neugefundenen armenischen Keilinschriften. Verhandl. d. Berl. Gesellsch. f. Anthrop., Berl., 1892, xxiv, 477-488. — **Berté** (F.) Il tatuaggio in Sicilia. Bull. d. r. Accad. med. di Roma, 1891-2, xviii, 629-631. — **Bertholon.** Exploration anthropologique de la Khroumirie. Bull. Soc. d'anthrop. Par., 1893, 4. s., iv, 689-692. — **Bertillon** (J.) et **A. Bertillon.** Résultats statistiques de l'anthropométrie appliquée à l'identification des personnes. Tr. vii. Internat. Cong. Hyg. & Demog. 1891, Lond., 1892, x, 303-307. — **Blanchi** (A. G.) Il contagio delle sommosse popolari. (Note sulle sommosse agricole nell' Alto Milanese). Arch. di psichiat., etc., Torino, 1893, xiv, 43-52. — **Bianchi** (S.) Sopra alcune varietà del cranio osservate in feti umani ed in altri mammiferi. Monitore zool. ital., Firenze, 1893, iv, 11-17. — **Blake** (L. I.) and **W. S. Franklin.** In regard to color-blindness among Indians. Science, N. Y., 1893, xxi, 297. — **Boas** (F.) Anthropologie in Amerika. Cor.-Bl. d. deutsch. Gesellsch. f. Anthrop., etc., München, 1893, xxiii, 114-116. — Vocabulary of the Kwakiutl language. Proc. Am. Phil. Soc., Phila., 1893, xxxi, 34-82. — Sagen der Indianer in Northwest-America. Verhandl. d. Berl. Gesellsch. f. Anthrop., 1892, 314; 383. — The doctrine of souls and of disease among the Chinook Indians. J. Am. Folk-Lore, Bost. & N. Y., 1893, vi, 39-43. — **Bordier** (A.) Naissance et évolution des idées et des pratiques médicales; superstitions médicales. Rev. mens. de l'École d'anthrop. de Par., 1893, iii, 41-59. — **Braislin** (W. C.) On the ethnological characteristics of the human nasal canals, considered as an economic adaptation. Science, N. Y., 1893, xxi, 169. — **Brinton** (D. G.) Remarks on certain Indian skulls from burial mounds in Missouri, Illinois, and Wisconsin. Tr. Coll. Phys. Phila., 1892, 3. s., xiv, 217-219. — **Capitan** (L.) Des maladies dans les diverses conditions sociales. Rev. mens. de l'École d'anthrop. de Par., 1893, iii, 123-136. — **Chamberlain** (A. F.) Human physiognomy and physical characteristics in folk-lore and folk-speech. J. Am. Folk-Lore, Bost. & N. Y., 1893, vi, 13-24. — Report on the Kootenay Indians of south-eastern British Columbia. [Introduction by H. Hale.] Rep. Brit. Ass. Adv. Sc., 1892, Lond., 1893, 545-615, 3 tab. — **Chase** (W. G.) Notes from Alaska. J. Am. Folk-Lore, Bost. & N. Y., 1893, vi, 51-53. — **de Closmadeuc.** Dolmen des Pierres-Plates en Locmariaquer. Bull. Soc. d'anthrop. Par., 1893, 4. s., iv, 692-710. — **Clouston** (T. S.) Some developmental and evolutionary aspects of criminal anthropology. Rep. Brit. Ass. Adv. Sc., Lond., 1892, 1893, 904. — **Comhaire** (C.-J.) Cimetières de caractère franc et sans mobilier funéraire de Loën-Lixhe, Jupille et Xhoris (province de Liège). Bull. Soc. d'anthrop. de Brux., 1891-2, x, 70-80. — Fourneau préhistorique du l'âge du fer, à Sommeville-Verviers; les origines de l'industrie sidérurgique. *Ibid.*, 81-92. — **Corominas** (E.) Memoria distinguida con accésit en el concurso de premios de 1890, sobre el siguiente tema: Si las condiciones anatómicas del organismo humano pueden influir en los actos del hombre? Que reglas ha dictado la ciencia para distinguir las acciones criminales de la meritorias? An. r. Acad. de med., Madrid, 1892, xii, 293-367. — **Cruttsburg** (N.) Ueber

metaphysische Probleme in der Zoologie; eine Kritik der Darwinschen Theorie. Abhandl. d. naturf. Gesellsch. zu Halle, 1892, xvii, 461-473.—**Cushing** (F. H.) Habitations affected by environment. Great Divide, Denver, 1893, ix, 78.—**D'Abundo** (G.) Osservazioni nei Minori corrigendi. Ann. di nevrol., Torino, 1892, n. s., x, 279-290.—**Debierre** (C.) La crâniologie et le crime. Arch. de l'anthrop. crim., Par., 1893, viii, 113-137.—**Discussion** sur le sabre et l'épée. Bull. Soc. d'anthrop. Par., 1893, 4. s., iv, 599-601.—**Discussion** sur la couleur des celtes. *Ibid.*, 672-680.—**Dolley** (C. S.) The Thyrsos of Dionysos and the palm inflorescence of the winged figures of Assyrian monuments. Proc. Am. Phil. Soc., Phila., 1893, xxxi, 109-116.—**Dormal**. Observations sur un nouveau facies du quaternaire et sur quelques stations préhistoriques. Bull. Soc. d'anthrop. de Brux., 1891-2, x, 57-59.—**Dorsey** (J. O.) Two Biloxi tales. J. Am. Folk-Lore, Bost. & N. Y., 1893, vi, 48-50.—**Dumont** (A.) Démographie des Basques de Balgorry. Rev. mens. de l'École d'anthrop. de Par., 1892, ii, 395-404.—**Bybowski** (J.) Les couteaux de jet de l'Oubangui. Bull. Soc. d'anthrop. Par., 1893, 4. s., iv, 97-100. — Les races et mœurs des populations de l'Afrique centrale. [Résumé]. *Ibid.*, 104-111.—**v. Brökert**. Archäologische Ausgrabungen in Ungarn, namentlich in Pilin, 1892. Verhandl. d. Berl. Gesellsch. f. Anthrop., Berl., 1892, xxiv, 569-576.—**Ferrero** (G.) Le mensonge et la véracité chez la femme criminelle. Arch. de l'anthrop. crim., Par., 1893, viii, 138-150.—**Finlayson** (J.) Ancient Egyptian medicine. Brit. M. J., Lond., 1893, i, 748; 1014; 1061.—**Finn** (W.) Zur Frage der prähistorischen Musikinstrumente. Verhandl. d. Berl. Gesellsch. f. Anthrop., Berl., 1892, xxiv, 544.—**Fletcher** (R.) The poet—is he born, not made? Am. Anthrop., Wash., 1893, vi, 117-135.—**Garson** (J. G.) Report of the committee for the purpose of carrying on the work of the anthropometric laboratory. Rep. Brit. Ass. Adv. Sc., 1892, Lond., 1893, lxii, 618-624. — On some very ancient skeletons from Medum, Egypt. *Ibid.*, 912.—**Glog-**

ner and **R. Virchow**. Sieben malaische Schädel. Verhandl. d. Berl. Gesellsch. f. Anthrop., 1892, 378-382.—**Götze** (A.) Die paläolithische Fundstelle von Taubach bei Weimar. *Ibid.*, 366-377.—**Grinnell** (G. B.) A Black-foot sun and moon myth. J. Am. Folk-Lore, Bost. & N. Y., 1893, vi, 44-47.—**Gross** (V.) and **R. Virchow**. Hand eines Mannes mit zwei Daumen. Verhandl. d. Berl. Gesellsch. f. Anthrop., 1892, 350-352.—**Guibert**. Évolution mentale et microcéphalie. Bull. Soc. d'anthrop. Par., 1893, 4. s., iv, 710-725.—**Haberlandt** (M.) Ueber eine Graburne von den Liukiu-Inseln. Mitth. d. Anthrop. Gesellsch. in Wien, 1893, xxiii, 39-42.—**Hagen** (A.) Les indigènes des Iles Salomon. Anthropologie, Par., 1893, iv, 1-10.—**Harlé** (E.) Les brèches à ossements de Montousse. Bull. Soc. d'anthrop. de Par., 1892, 4. s., iii, 603-605.—**Hartmann** (R.) Die künstlichen Augen peruanischer Mumien. Verhandl. d. Berl. Gesellsch. f. Anthrop., Berl., 1892, xxiv, 504.—**Hartog** (M.) On Rabl's doctrine of the personality of the segments of the nucleus, and Weismann's "idant" theory of heredity. Rep. Brit. Ass. Adv. Sc., 1892, Lond., 1893, 742-744.—**Hein** (W.) Die Kopftrophäen der Jivaros. Mitth. d. Anthrop. Gesellsch. in Wien, 1893, xxiii [Sitzungsb.], 28.—**Heppburn** (D.) The integumentary grooves on the palm of the hand and sole of the foot of man and the anthropoid apes. Rep. Brit. Ass. Adv. Sc., Lond., 1892, 1893, 909.—**Hermes** (O.) Aus dem Gefangenleben des Gorilla. Verhandl. d. Berl. Gesellsch. f. Anthrop., Berl., 1892, xxiv, 576-582.—**Herrmann** (A.) Volksthümliches aus Dobschan in Oberungarn. Mitth. d. Anthrop. Gesellsch. in Wien, 1893, xxiii [Sitzungsb.], 9. — Weltuntergang in der magyarischen Tradition. *Ibid.*, 10-12.—**von Hölder**. Die Schädel von Cannstatt und Neanderthal. Cor-Bl. d. deutsch. Gesellsch. f. Anthrop., etc., München, 1893, xxiii, 88-94.—**Hoops** (J.) Pflanzenaberglaube bei den Angelsachsen. Globus, Braunschweig, 1893, lxiii, 303-328.—**Hough** (W.) Time-keeping by light and fire. Am. Anthrop., Washington, 1893, vi, 207-210.—**Houzé** (E.) Les Francs des

cimetières de Belgique. Bull. Soc. d'anthrop. de Brux., 1891-2, x, 28-53.

— Crâne et cerveau d'un scapho-céphale; surdit  centrale; simplicit  et atrophie des lobes temporaux. *Ibid.*, 93-97. — **Hovelacque** (A.) et **G. Herv **. Couleur des yeux et couleur des cheveux dans le Morvan. Rev. mens. de l' cole d'anthrop. de Par., 1893, iii, 60-64. — **Hutchinson** (J.) A short-limbed polydactylous dwarf. Arch. Surg., Lond., 1892-3, iv, 305, 1 pl. Congenital defects and inherited proclivities. *Ibid.*, 305-313.

— Diffuse ichthyosis in a case of consanguineous marriage; three children affected. *Ibid.*, 309. — **Imbert**. Note sur le gisement de la Torche de Penmarc'h. Bull. Soc. d'anthrop. Par., 1893, 4. s., iv, 45-48. — **Jacques** (V.) Conf rence de M. le capitaine F. Vandev de sur les collections ethnographiques rapport es de son dernier voyage au Congo; notes recueillies par . . . Bull. Soc. d'anthrop. de Brux., 1891-2, x, 59-67, 2 pl. — **Jamison** (Mrs. C. V.) Signs and omens from Nova Scotia. J. Am. Folk-Lore, Bost. & N. Y., 1893, vi, 38.

— **Koganei** (R.) [Torsion of the humerus.] Ztschr. d. med. Gesellsch. Tokio, 1893, vii, no. 1, 1-3. — **Kollmann** (J.) Die ethnologischen und rassenanatomischen Studien in British Indien. Internat. Arch. f. Ethnog., Leiden, 1893, vi, 48-52. — **Kollook** (C. W.) The eye of the negro. Tr. Am. Ophth. Soc., Hartford, 1892, vi, 257-268. Also, Ann. Ophth. & Otol., St. Louis, 1893, ii, 121-126. — **Kroutowsky** (W.)  tude des ossements recueillis dans les s pultures n olithiques de Ch lon-sur-Marne et de Mareuil-les-Meaux. Bull. Soc. d'anthrop. de Par., 1892, 4. s., iii, 481-484.

— **Lapicque** (L.)  tude quantitative sur le r gime alimentaire des Abyssins. Compt. rend. Soc. de biol., Par., 1893, 9. s., v, 251-258. — **Le Dantec**. Origine tellurique du poison des fl ches des naturels des Nouvelles-H brides (O c nie). Arch. de m d. nav., Par., 1893, lix, 5-17. — **Lef vre** (A.) La liturgie et la morale Mazd ennes. Rev. mens. de l' cole d'anthrop. de Par., 1893, iii, 73-89. — **Legrand**. Une colonie p nitentiaire; la Nouvelle-Cal donie. Arch. de l'anthrop. crim.,

Par., 1893, viii, 93-104. — **Letourneau** (C.) Les signes alphab tiformes des inscriptions m galithiques. Bull. Soc. d'anthrop. de Par., 1893, 4. s., iv, 28-45. — **Lissauer**. Ueber einige westpreussische Bronzeringe und deren Verbreitung. Verhandl. d. Berl. Gesellschaft. f. Anthrop., Berl., 1892, xxiv, 469-476. — **Lombroso** (C.) Avvenatori-nati. Arch. di psichiat., etc., Torino, 1893, xiv, 123-130. — La fossette occipitale selon M. Debie re. Compt. rend. Soc. de biol., Par., 1893, 9. s., v, 412. — **Luciani** (L.) Les origines de la vie. Rev. scient., Par., 1893, li, 97-107. — **v. Luschan** (F.) Hirnschale, Unterkiefer, Herz und Hand eines Ermordeten von Togoland. Verhandl. d. Berl. Gesellschaft. f. Anthrop., Berl., 1892, xxiv, 465. — **McGuire** (H.) and **G. F. Lydston**. Sexual crimes among the southern negroes, scientifically considered. Virginia M. Month., Richmond, 1893-4, xx, 105-125. — **Maass**. Die zusammengewachsenen weiblichen Zwillingekinder Radika und Doadika. Verhandl. d. Berl. Gesellschaft. f. Anthrop., Berl., 1892, xxiv, 583-586. — **Macalister** (A.) Anthropology. [President's address.] Rep. Brit. Ass. Adv. Sc. 1892, Lond., 1893, 886-895. — **MacDonald** (A.) Observations pour servir   l'histoire de la sexualit  pathologique et criminelle. [Transl. from the English.] Arch. de l'anthrop. crim., Par., 1893, viii, 40. — **Maomillan** (C.) On the emergence of a sham biology in America. Science, N. Y., 1893, xxi, 184-186. — **Magitot**. Moulanges de doigts recueillis sur des cagots de Salies-de-B arn. Bull. Soc. d'anthrop. de Par., 1892, 4. s., iii, 553-572. — **Manouvrier** (L.) Nouvelle  tude sur le sillon sous-frontal intra-limbique et sur la fusion du lobe du corps calleux avec les lobes adjacents. *Ibid.*, 504-529. — Le cerveau d'un Polyn sien. *Ibid.*, 581-588. — On a fronto-limbic formation of the human cerebrum. Rep. Brit. Ass. Adv. Sc., Lond., 1892, 1893, 897. — **Mateer** (Rev. S.) On social reforms amongst the Nayars of Malabar. J. Anthrop. Soc. Bombay, 1891, ii, 317-320. — **Mestre** (A.) De las relaciones entre los diversos estados patol gicos, consideradas en el individuo y en la s rie ancestral y hered-

itaria. Am. r. Acad. de cien. med. . . . le la Habana, 1892-3, xxix, 438-459.—**Meynert** (T.) "Genie und Verbrecher" von Lombroso. Mitth. d. Anthrop. Gesellsch. in Wien, 1893, xxiii [Sitzungsb.], 1-9.—**Mooney** (J.) A tuneful liar. Another phase of contemporary journalism. How a syndicate article on the Navajos was made by appropriating and mis-applying the work of well-known ethnologists. New York Tribune, April 14, 1893, p. 12.—**de Mortillet** (A.) Chat sans queue de l'Isle de Man. Bull. Soc. d'anthrop. de Par., 1893, 4. s., iv, 18-13.—**de Mortillet** (G.) Anthropologie de la Haute-Savoie. *Ibid.*, 1892, 4. s., iii, 588-598. — Age du bronze; tourbières et habitations lacustres. Rev. mens. de l'École d'anthrop. de Par., 1893, iii, 105-122.—**Muccioli** (A.) Degenerazione e criminalità nei colombi. Arch. di psichiat., etc., Torino, 1893, xiv, 39-42.—**Munro** (R.) On trepanning the human skull in prehistoric times. Rep. Brit. Ass. Adv. Sc., 1892, Lond., 1893, lxii, 912.—**de Nadaillac**. La figurine de Nampa. Bull. Soc. d'anthrop. Par., 1893, 4. s., iv, 668-671.—**Näcke** (P.) Die anthropologisch-biologischen Beziehungen zum Verbrechen und Wahnsinn beim Weibe. Allg. Ztschr. f. Psychiat., etc., Berl., 1892-3, xlix, 540-613.—**Naidoo** (C. P. S.) Hindu matrimonial rites in Madras. J. Anthropol. Soc. Bombay, 1891, ii, 380-403.—**Ogata** (M.) [On tail of human embryo.] Ogata Biyoen Ijikwai Ho, Tokio, 1892, no. 49, 157-165.—**Oltuszewski** (W.) [Physiology of sounds of Polish alphabet.] Medycyna, Warszawa, 1893, xxi, 189-194.—**Ornstein**. Ein Zwerg in Athen. Verhandl. d. Berl. Gesellsch. f. Anthrop., Berl., 1892, xxiv, 541-543.—**Orsi** (P.) and **R. Virchow**. Schädel von Megara Hyblasa. *Ibid.*, 347-350.—**Ostmann**. Ueber das Abhängigkeitsverhältniss der Form des äusseren Gehörgangs von der Schädelform. Monatschr. f. Ohrenh., Berl., 1893, xxvii, 57.—**Palmer** (W. H.) The intellectual and ethical capacity of the brain. Tr. Rhode Island M. Soc. 1892, Providence, 1893, iv, pt. iv, 371-381.—**Pector** (D.) Ethnographie de l'archipel Magellanique. Internat. Arch. f.

Ethnog., Leiden, 1892, v, 215-221.—**von Ranke** (H.) Ueber Hochäcker. Beitr. z. Anthrop.-u. Urgesch. Bayerns, München, 1892, x, 141-180, 13 ch., 2 pl.—**Ranke** (J.) Ueber Schädel aus Melanesien (Neu-Britannien). Cor.-Bl. d. deutsch. Gesellsch. f. Anthrop., etc., München, 1893, xxiii, 119-122.—**von Rath** (O.) Kritik einiger Fälle von scheinbarer Vererbung von Verletzungen. [From: Ber. d. naturf. Gesellsch. zu Freib. i. Br., vi.] Biol. Centralbl., Leipz., 1893, xiii, 65-76.—**Rebentisch** (E.) Der Weiberschädel. Morphol. Arb., Jena, 1892-3, ii, 207-274.—**Regnault** (F.) Les effets de la consanguinité. Rev. scient., Par., 1893, li, 232; 266.—**Reinach** (S.) Le chêne dans la médecine populaire. Anthropologie, Par., 1893, iv, 32-35.—**Reinach** (T.) De quelques faits relatifs à l'histoire de la circoncision chez les peuples de la Syrie. *Ibid.*, 28-31.—**Renzoni** (R.), **G. Limoncelli**, ed **A. Zuccarelli**. Un processo, per omicidio a colpi di scure, studiato antropologicamente; relazione medico-legale sulle condizioni somatofisio-psichiche del giudicabile Sinese Savino, al Sig. Pretore della sezione S. Carlo all'Arena in Napoli. Anomalo, Napoli, 1892, iv, 161; 193; 257.—**Reymann** (K.) Technische Vorkenntnisse zur Hausforschung. Mitth. d. Anthropol. Gesellsch. in Wein, 1893, xxiii [Sitzungsb.], 12-27.—**Riccardi** (P.) L'indice cefalico in una serie di Bolognesi. Rassegna di sc. med., Modena, 1893, viii, 20-25.—**Richer** (P.) L'anatomie dans l'art; proportions du corps humain; canons artistiques et canons scientifiques. Rev. scient., Par., 1893, li, 289-300.—**Roncoroni** (L.) Influenza del sesso sulla criminalità in Italia. Arch. di psichiat., etc., Torino, 1893, xiv, 1-14.—**Rutherford** (W.) [Current theories regarding our sense of colour.] Rep. Brit. Ass. Adv. Sc. 1892, Lond., 1893, 728-742.—**Salmon** (P.) Exposé méthodique des divisions industrielles aux Ages de la pierre. Bull. Soc. d'anthrop. de Brux., 1891-2, x, 120-137, 17 pl.—**Santangelo** (F.) Tatuaggio e pazzia morale. Arch. di psichiat., etc., Torino, 1893, xiv, 115-122, 1 pl.—**Savage** (G. H.) Symptoms of mental dissolution. Med. Press. and Circ.,

- Lond., 1893, n. s., lv, 451-454. — **Scheboldaef** (W.) [Tailed men.] Zemsk. vrach., Poltava, 1893, vi, 2; 28. — **Schmelz** (J. D. E.) Beiträge zur Ethnographie von Borneo. Internat. Arch. f. Ethnog., Leiden, 1892, v, 232-238, 2 pl. — **Schmidt** (E.) Die Körpergrösse und das Gewicht der Schulkinder des Kreises Saalfeld (Herzogthum Meiningen). Arch. f. Anthrop., Brnschw., 1892-3, xxi, 385-434. — **Schmit**. Objets néolithiques recueillis dans le dolmen de la Croix-des-Cosaques à Châlons-sur-Marne. Bull. Soc. d'anthrop. Par., 1893, 4. s., iv, 488-497. — **Schumann**. Skeletgräber vom Galgenberg bei Wollin (Pommern). Verhandl. d. Berl. Gesellsch. f. Anthrop., Berl., 1892, xxiv, 492-497. — Skeletgrab mit römischen Beigaben von Zirzlaff (Insel Wollin). *Ibid.*, 497-499. — **Sergi** (G.) Di una nuova classificazione umana. Anomalo, Napoli, 1892, iv, 321-326. — Crani della Melanesia. *Ibid.*, 327-331. — Cranioforo di Benedikt. Arch. di psichiat., etc., Torino, 1893, xiv, 143-145. — Die Menschenvarietäten in Melanesien. [Transl. from: Bull. d. r. Accad. med. di Roma, 1891-2, xviii.] Arch. f. Anthrop., Brnschw., 1892-3, xxi, 339-383. — Di alcune varietà umane della Sardegna. Bull. d. r. Accad. med. di Roma, 1891-2, xviii, 609-623. — **Siégeois** (J.) Der Fall Chambige vor dem Schwurgerichtshof in Constantine (Algier) 1888; eine Studie der criminellen Psychologie. Ztschr. f. Hypnot., etc., Berl., 1892-3, i, 212; 234. — **Simplified Spelling**. A symposium on the question "Is simplified spelling feasible as proposed by the English and American Philological Societies?" Am. Anthrop., Washington, 1893, vi, 137-206. — **Snell** (M.-M.) The nature of the science of comparative religion. Oriental Rev., Washington, 1893, i, 12-19. — **Soffiantini**. Anomalies costo-vertébrales numériques par excès héréditaires. Bull. Soc. d'anthrop. de Par., 1893, 4. s., iv, 13-21. — **Sonne** (E.) Die Bewohner Britisch-Nord-Borneos mit besonderer Berücksichtigung der Badjohs, Tumboas und Sundajaks. Mitth. d. Anthrop. Gesellsch. in Wien, 1893, xxiii, [Sitzungsb.] 28-32. — **Sorel** (G.) La position du problème de M. Lombroso. Rev. scient., Par., 1893, li, 206-210. — Le crime politique, d'après M. Lombroso. *Ibid.*, 561-565. — **Stevens** (H. V.) and **R. Virchow**. Schädel und Haar der Orang Panggang in Malacca. Verhandl. d. Berl. Gesellsch. f. Anthrop., 1892, 439-444. — **Struthers**. On the articular processes of the vertebrae in the gorilla compared with those in man, and on costo-vertebral variation in the gorilla. Rep. Brit. Ass. Adv. Sc., 1892, Lond., 1893, lxii, 906. — **Sutherland** (J. F.) The criminal and the habitual offender from an economic, statistical, and social standpoint. *Ibid.*, 845. — **Svoboda** (W.) Die Bewohner des Nikobaren-Archipels, nach eigenen Beobachtungen, älterer und neuerer Quellen. Internat. Arch. f. Ethnog., Leiden, 1892, v, 149, 4 pl., 185, 2 pl., 189, v, 1, 3 pl. — **Swinnerton** (R. A. W.) [Belief of the uncleanness of women at certain recurrent periods.] J. Anthrop. Soc., Bombay, 1891, ii, 403. — **Tarde** (G.) Biologie et sociologie; réponse au Dr. Bianchi. Arch. de l'anthrop. crim., Par., 1893, viii, 7-20. — **Tarnowsky** (Pauline). Sur les organes des sens des femmes criminelles et des prostituées. Arch. di psichiat., etc., Torino, 1893, xiv, 25-38. — Fisionomie di prostitute russe. *Ibid.*, 141, 1 pl. — **Thomas** (C.) Prehistoric remains in America. Science, N. Y., 1893, xxi, 178. — **Tomaschek** (W.) Das Verhältniss der Thraker und Illyrier zu einander. Mitth. d. Anthrop. Gesellsch. in Wien, 1893, xxiii, [Sitzungsb.] 32-36. — **Treon** (F.) The effect of education on the American Indian. Med. Rec., N. Y., 1893, xliii, 389-392. — **Tschich** (V. F.) [A study of organic criminality.] Arch. psichiat., etc., Charkov, 1893, xxi, no. 1, 137-176. — **Vanderkindere**. Sur l'origine des blonds de l'Europe. Bull. Soc. d'anthrop. de Brux., 1891-2, x, 99-106. — **Venn** (J.) Results of anthropometry at Cambridge. Tr. vii, Internat. Cong. Hyg. and Demog., 1891, Lond., 1892, x, 308-314. — **Virchow** (R.) Anthropologisches aus Malacca. Cor.-Bl. d. deutsch. Gesellsch. f. Anthrop., etc., München, 1893, xxiii, 106. — Fundstücke vom Schweizerbild bei Schaffhausen.

Verhandl. d. Berl. Gesellsch. f. Anthrop., Berl., 1892, xxiv, 455-458. — Gräberschädel von Reitwein an der Oder. *Ibid.*, 550-555. — **Viré** (A.) La Kabylie du Djurjura. Bull. Soc. d'anthrop. Par., 1893, 4. s., iv, 66-88. — **Volkov** (T.) Rites et usages nuptiaux en Ukraine. Anthropologie, Par., 1892, iii, 541-588. — **Waldeyer**. Anomalien des harten Gaumens. Verhandl. d. Berl. Gesellsch. f. Anthrop., 1892, 427-430. — **Weale** (J. M.) On the probable derivation of some characteristic sounds in certain languages from cries or noises made by animals. Rep. Brit. Ass. Adv. Sc., Lond., 1892, 1893, 907. — **Wilser** (L.) Badische Schädel. Arch. f. Anthrop., Brnschw.,

1892-3, xxi, 435-445. — **Woldrich** (J. N.) Beiträge zur Urgeschichte Böhmens. Mitth. d. anthrop. Gesellsch. in Wien, 1893, n. F., xiii, 1-38, 1 pl. — **Wright** (C. D.) Relations of economic conditions to the causes of crime. Ann. Am. Acad. Polit. and Social Sc., Phila., 1893, iii, 96-116. — **Yamai** (K.) [Relation between criminal anthropology and medical jurisprudence.] Hoigakwai Syashi, Tokio, 1893, no. 80, 121-123. — **Zaborowski**. Disparités et avenir des races humaines. Bull. Soc. d'anthrop. de Par., 4. s., iii, 617-665. — **Zapf** (L.) Eine alte Felszeichnung im Fichtelgebirge. Beitr. z. Anthrop.-u. Urgesch. Bayerns, München, 1892, x, 181-184.

NOTES AND NEWS.

HERR BÜTTIKOFER, zoologist and curator of the Royal Museum in Leyden, who has, in his "*Reisebilder aus Liberia*," given us the most complete study of any defined region of Central Africa that we have seen, says that among the Liberian hunters it is a common report that the older individuals of the chimpanzees defend themselves when attacked with cudgels, which, if true, would seem to throw doubt upon the statement sometimes made that the tools of the lower animals are invariably organic, while those of man are mechanical.

The cleared spaces which one occasionally comes across in the African forests are, upon the same authority, used by the chimpanzees to build immense bonfires of dried wood gathered from the neighborhood. When the pile is completed one of the chimpanzees begins to blow at the pile as if blowing the fire. He is immediately joined by others, and eventually by the whole company, and the blowing is kept up until their tongues hang from their mouths, when they sit around it upon their haunches with their elbows on their knees and holding up their hands to the imaginary blaze. In wet weather they frequently sit in this way for hours together. The native races invariably sit upon their heels.

The chimpanzee is considered above all other beasts, and no one will eat it, as it is too much like man, while the smaller monkeys are generally eaten. I have, says Herr Büttikofer, more than once in the dark forest just escaped killing a negro for a baboon, and the im-

pression made upon me by the human expressions of a dying chimpanzee was so great that I have never forgotten it, and, with one or two exceptions, I have never shot at them since.

Büttikofer occasionally employed in hunting young negro boys, whose natural senses were so acute that, like scenting dogs, they could discover game in the dark, and whose sharp eye-sight and hearing enabled them to see or hear the least movement.

The devil dances of the aborigines, with their frantic, mad life and noise, deafening drums, and the shrieking songs of the perspiring dancers, lasting for several days and nights, reminded him of the meeting of a village church association in Holland.

A settlement of Americo-Liberians, original immigrants from the United States or their descendants, on the Mahfa river, has reverted to aboriginal habits and has abandoned all clothing except the loin-cloth. Mr. Warner, son of the former President of Liberia, upon the death of his wife and the inheritance of his father's property, established a native town and maintains a harem of several native wives living in the aboriginal condition. Warner, a younger son, was cook and washerwoman in my employ, preferring these occupations to that of a farmer.

In the house of Clark, a native "Christian chief," was a fetich, and over his door a motto in Arabic, probably from the Koran. This man professed Christianity, was particularly educated at a Christian mission, had two sons there, and was a polygamist. Clark knew how to reconcile feticism and polygamy with Christianity. Beside the Clarks, the grigri or medicine man practiced his charms, and an old Mandenga Mohammedan recited his prayers and sang his Allah-il-Allah. Büttikofer concludes that Liberia is a land of the greatest religious and social freedom.

At Clark's village, in the evening during a great war dance and amid the deafening noises of drums and a mock fight, Clark appeared riding on a man's back, who had his arms around the waist of another who had reins in his mouth, the remarkable fact being that no one present had ever seen a man on horseback.

The Veis, an aboriginal Liberian tribe, only count to 100, and, as a rule, the other natives only to 20. European contact has given some of the tribes the word hondo, signifying one hundred. It is a remarkable fact that the Pessas, a tribe which hardly comes in contact with Europeans or Americo-Liberians, has a decimal, instead of the common vigesimal system.

The state of culture of the aboriginal population is not as low as

is imagined. The Veis have an alphabet, and in writing use a reed. The Golas are mighty and powerful, warlike and cunning; the Busis farmers and weavers, having large markets and strongly fortified villages; the Mandengas skillful in leather-work, good smelters, smiths, farmers, and weavers; but in the centuries which have passed since Central Africa was first known to Europeans little change has taken place. The first or oldest account of these particular peoples is by a Dutchman named Dapper, some two hundred years ago, and I could, says Büttikofer, in a descriptive account of them, repeat his language, word for word.

It is the custom of the tribes on the Mahfa to remove the viscera from the abdomen of the slain, and cutting off the hands and feet to put them in their place. Of two Liberian traders (Americo-Africans) going up the Mahfa, one was sold into slavery and the other killed, disemboweled, and decapitated. On a hunting expedition "I found," says Büttikofer, "six or eight skeletons treated in this way lying in a brook."

The natives believe in a system of rewards and punishments, and in the immortality of the soul. Exactly what they believe of the future state it is impossible to find out. The souls of the dead are ever present, and if earnestly called up in dreams will appear. The belief in good or bad spirits is universal, and they are always about, ready to be propitiated by sacrifices and charms. The fetich or grigri itself is not the subject of prayer or adoration; at the same time they have great faith in charms. God's judgment is of great importance to the natives when they cannot prove an *alibi*. A decoction of sasswood is used to detect persons guilty of charming or bewitching others. The result is to make the natives fatalists.

On an island in Cestos bay there is a mausoleum of native chiefs, the bodies laid away in coffins above the ground. The coffin of King Ban-Flan, the brother of the present King Davis, recently deceased, rests upon a smooth place upon the ground covered with cloth, and upon it were spread out iron dishes, plates, bottles, cups, and herring boxes. Here the soul of Ban-Flan holds guardianship over his living successor, the dishes being the symbol of life for one generation. When King Davis dies the dishes will be broken, King Ban-Flan's coffin put into the bush, and its place taken by that of King Davis.

In pulling through the dangerous surf along the coast the natives pour out a libation to the gods, as, no doubt, did the Carthaginians, their predecessors on this shore 2,500 years ago.

BOOK NOTICES.

The Song of the Ancient People by Edna Dean Proctor with Preface and Notes by John Fiske and Commentary by F H Cushing Illustrated with eleven Aquatints by Julian Scott Boston and New York 1893

The review of a poem would ordinarily not come within the province of a journal devoted to science, but "The Song of the Ancient People" is so strictly based on modern ethnological researches that we feel we may make an exception in its favor and treat of it in the pages of THE AMERICAN ANTHROPOLOGIST.

We have long been impressed with the idea that efforts to put the American Indian into poetry have not been eminently successful. Some of the greatest poetic geniuses of our nation have made the attempt without adding to their reputation. The causes for this are difficult to assign. The Indian has done good service in prose fiction, but he has refused to move easily in the shackles of verse.

We think Miss Proctor has succeeded better than any of her predecessors in producing a poem with the Indian for its subject. This success is due, no doubt, in part to the literary skill of the author; but it is also largely due to the fact that she has made a new departure. Heretofore poets have dwelt mostly on the combative and revengeful elements of the Indian character and have overlooked his contemplative and religious nature. In Miss Proctor's poem there is no flashing of angry eyes, no calling upon gods that never existed in the Indian pantheon, no muttering of curses that Indians never knew till white men taught them, no digging up of hatchets; in short, none of the worn-out stage properties with which we are so well and wearily acquainted. The poetess sings of higher and more romantic elements in the American autochthon; of his pride and confidence in his own savage lore and philosophy; of his reverence for the gods of his fathers; of his faith in the picturesque paganism which is his heritage; and, lastly, of his brave resignation to a fate which he beholds approaching and knows he cannot avert. For her Indian there is no Messiah. He bows his head proudly and awaits the stroke.

The poem is in the form of a monologue addressed to the Caucasian intruder by a Pueblo Indian of the Southwest, most probably an inhabitant of the pueblo of Zúñi; but the author leaves us in some doubt as to the exact home of her hero. The poetic execution is of a superior character and shows the work of a skillful hand. The scientific exactness of the composition is vouched for by the well-known "Zúñi Familiar," Mr. Frank Hamilton Cushing, who appends to Miss Proctor's poem an interesting "Commentary," in which we find only words of approval. Many allusions in the poem, not familiar to the general reader, are explained in the notes by Mr. John Fiske.

Scarcely less to be praised than the rhyme of the poet is the page of the artist, the famous battle-scene and portrait painter, Mr. Julian Scott, who has embellished this beautiful publication with eleven full-page aquatints. Previous to undertaking this work Mr. Scott spent two seasons in New Mexico and Arizona studying the peculiar landscape and atmospheric effects of this region, as well as the dress, figures, faces, and surroundings of "The Ancient People" themselves. His faithful illustrations are the result of these studies.

The publishers have done their share to make the book attractive. Paper, typography, and binding are all in excellent taste, and represent the best work of the Riverside Press.

W. MATTHEWS.

Finger Prints. By Francis Galton, F. R. S., etc. London, Macmillan & Co., 1892.

The old legal maxim "*De minimis non curat lex*" has no application in science. There is nothing too minute to escape examination, description, and classification. Mr. Galton, with his characteristic industry, accuracy, and power of marshalling facts, has now published the results of his observations, extending over several years, upon those curiously curved minute furrows found upon the palmar surface of the ends of the fingers.

It has been long supposed that different individuals were characterized by special patterns of these markings, indeed they have occasionally been used for purposes of identification. Mr. Galton has put the matter to the proof of experiment and finds that when

two finger prints are alike in their minutiae the chance against their being made by two different persons is as 1 to 64,000,000,000. When the prints of two different fingers of one person agree with two of another person this inconceivable number is squared, with three fingers, cubed, &c. As these patterns are practically unchanged from infancy until old age or even after death, it will be seen that we possess here a means of identification far exceeding any other now known in evidential value.

A small and very simple roller is used to apply the ink for taking impressions, which for purposes of accurate comparison may be enlarged by photography. The different forms are susceptible of classification and arrangement, so that they may be quickly and conveniently compared.

Family resemblances are found to exist, the maternal influence being more powerful than the paternal. There appears to be no peculiar pattern characterizing any particular race and occupation; habit and mental characteristics have no ascertainable influence.

'The Ruined Cities of Mashonaland, being a Record of Excavation, and Exploration in 1891.' Longman, Green & Co. London and New York, 1892.

The name of J. Theodore Bent stands near the head of the list of living ethnologists. Though quite a young man, he has devoted many years to the study of ethnology, more especially on prehistoric and on classic grounds. His studies have not been at all confined to the library or laboratory. Accompanied by his wife, he has spent many seasons, first among the islands of the Greek archipelago in Asia Minor, "in rugged Cilicia," the entire year 1891 in southern Africa, 1892 in Abyssinia. Possessed of sufficient income not to be dependent for his living upon the rewards of his work, he has pursued his investigations and studies practically without compensation. His work has recommended itself to the scientific societies of England, of which the pioneer in this regard was the British Association for the Advancement of Science, but to which has been added the Royal Geographic Society, and, for his voyage into Mashonaland, the British Chartered Company for South Africa. Some or all of

these associations for nigh ten years past voted subsidies to Mr. Bent in aid of his investigations, and it was one of the features of the Anthropological Section of the British Association to hear Mr. Bent's report of his preceding year's work. He has published some of the results of his investigations in brief, in a volume entitled "The Cyclades, or Life among the Insular Greeks," and there has just appeared from the press of Longman, Green & Co. the report of his visit to and voyage through Mashonaland under the above title, a volume of 376 pages, with maps, plates, and figures. He, accompanied by his wife and Mr. Swan, who acted in the capacity of cartographer, left England in January, 1891, returning in January, 1892. They landed at Cape Colony, made their way north through the British possessions, where they bought two wagons, thirty-eight oxen, and a store of tinned provisions; thence still north through Bechuanaland, through Khama's country, Chibi's country, by way of the Kalahari desert route, until, after three months' voyaging with the ox-wagon, they reached the mighty prehistoric ruins of Zimbadwe, $20^{\circ} 16' 30''$ south latitude, and $31^{\circ} 7' 30''$ of longitude east from Greenwich. Umgabe was the petty chief in whose country these ruins were situated. Mr. Bent hired from this chief thirty workmen, at the price of one blanket per month, which blankets cost 4s. 10d. at Fort Tuli, the northernmost point within the British colony. At this point he says he placed in his box and locked up all his money, and from thence during his entire six months' trip until his return to civilization he had neither need nor opportunity to use it, the required currency consisting of blankets, cloth, beads, and similar objects. They lived on poultry, eggs, milk, honey, sweet potatoes, tomatoes, chili, capers, rice, and monkey nuts. They became possessed of and brought back with them every kind of implement and utensil which they could obtain throughout their route. They remained two months at Zimbadwe excavating and investigating the ruined cities, fortresses, houses, walls, which there exist to so great an extent. These ruins were discovered in 1871 by a German, Karl Mauch, but had never been investigated until the expedition of Mr. Bent. They consisted generally of walls built of granite blocks about twice the size of ordinary bricks, laid up dry, sometimes as high as 35 feet above the ground, with a thickness of from 16 down to 5 feet. The ground-plans of the ruins show them to have been as extensive and intricate

as the great earthworks in the Scioto valley, Ohio. Some of them were intended for household purposes, others as fortresses for protection and defense, while the towers are believed to have had some religious significance. A large proportion of the archæologic finds consisted of objects of soapstone and pottery, both of which were deftly made with elaborate ornamentation. Spindle whorls of pottery were found in abundance, many objects of iron, and crucibles and furnace for smelting and melting gold.

Mr. Bent gives his conclusion on page 188: "It would seem to be evident that a prehistoric race built the ruins in this country, a race like the mythical Pelasgi, who inhabited the shores of Greece and Asia Minor, a race like the mythical inhabitants of Great Britain and France, who built Stonehenge and Carnac, a race which continued in possession down to the dawn of history, which provided gold for the merchants of Phœnicia and Arabia, and which eventually became influenced by and perhaps absorbed in the more powerful and wealthier organizations of Semites."

THOMAS WILSON.

Excavations in Bokerly and Wansdyke, Dorset and Wilts. 1888-1891. By Lieutenant-General Pitt Rivers, D. C. L., F. R. S., F. S. A. With observations on the human remains by J. G. Garson, M. D. Vol. III. Printed privately. [London:] 1892, pp. xiv-308, maps and plates, 4to.

What a substantial, splendid volume is this, in paper covers but still imposing. England may well be proud of its series of archeologic volumes, privately printed, which come out one after another to challenge our admiration and excite our rivalry. The work in symmetry and completeness is what would be expected from the author, whose portrait is given, and cannot but add to his already firmly established and enviable reputation. Little by little, but most surely, the prehistoric sites of England are being made to yield up their treasures of incident and art, and these classic volumes are the store-houses in which the harvests of history are garnered.

W. H. HOLMES.

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THE NAVAJO.

BY A. M. STEPHEN.

The Navajo, or, as they call themselves, Tin-néh, meaning "the people," constitute the most flourishing branch of that vigorous Athapascan stock which is spread in widely separate tribal communities on the Pacific slope, from Alaska to Mexico.

An extensive scope of land, embracing northeastern Arizona and the adjoining northwestern corner of New Mexico, is held by them as a reservation, with the Hopi, or so-called Moki, a small pueblo tribe, occupying its southwestern corner. These latter live in compact villages of stone houses, built on rocky promontories projecting from the higher table-lands. They have long been on fairly amicable terms with their neighbors, yet in some of their habits traces of an earlier hostile period still survive. They persist in clinging to their secluded habitations on mesa points of difficult access; they nightly shut up their flocks in little pens on cliff ledges close to their houses; and although the Navajo are constantly trafficking at their villages, it is rare for a Hopi to venture far among them, nor do the scornful insults of the Navajo ever provoke a Hopi to retaliate.

✓ *The Table-lands.*—This table-land region, although composed of horizontal sandstone measures, is by no means a mere elevated plain of level uniformity, for the area occupied by the Navajo displays a wide diversity of features. On the boundary line of the two territories it is traversed from south to north by the Tunicha mountains, a lofty range covered with magnificent pine forests, and wide plateaus lie folded along its flanks, through which solemn, cliff-walled cañons wind in tortuous courses into the heart of the range.

To the north and west, along the course of the San Juan, which forms the northern boundary of the Navajo country, broken ranges, occasionally clustering in high volcanic domes, confine the river in deep, gloomy gorges; and toward the south low sloping hills rise in straggling ridges covered with dwarfish pifion and gnarly juniper.

The waters of a primeval period have eroded spacious valleys through the great plateau which originally overlaid the entire region, and smaller defiles intersect it in every direction, cutting it up into numerous separate mesas, with steep, rocky cliffs sharply outlining their irregular forms. The principal valleys extend for long distances; one of them, called the Tchi-ni-li, stretches along the west side of the Tunicha range, exposing a broad, level pass across the reservation from its southern limit to the San Juan river and beyond. To the traveler following the low-lying trails the region presents itself as a land of cliff-walled, bare, sandy valleys, while to one upon the higher plateaus it offers an immense landscape of undulating plain, studded with woody hills, and viewed from the mountaintops the land seems everywhere cleft into a network of jagged cañons.

In the few weeks of early summer the table-lands are seen in their most attractive guise. High mesa plateau and low sandy valley become meadow-like with short grassy verdure, and richly adorned with flowers in profusion, blooming in surprising variety and beauty; marigold, larkspur, daisy and lily, and such familiar acquaintances mingling among countless clusters of less known flowering plants and fragrant herbage. The tracts of desert now strive to conceal their arid nature; the sagebrush contrives to imbibe sufficient sap to brighten its crisp gray leaves with a tint of green, and the furzy greasewood hangs in flakes of yellow bloom. Straggling beds of prickly pear spread out in exasperating luxuriance, and each thorny, green-skinned tablet, bursting with stemless blossoms, seems grafted with rosebuds. Vagrant pariahs of cactus kin are also glowing with rich-hued flowers of surpassing brilliance, crimson, pink, and gold, gorgeous and odorless. But within the broad horizon no winding streams flow through the valleys; no brook trickles down the mesa side; not a single glimpse of running water may be discovered. Valley and cliff and mesa level lie parching under a hot sun in a cloudless, unchanging sky, and this fair but arid landscape leaves a cheerless impression.

In July and August sudden, heavy showers of short duration

are common, and the sandy soil absorbs enough moisture to nourish vegetation. But the deep channels carved through mesa and valley carry off almost the entire rainfall in swift rushing torrents to the profound cañons of the San Juan and the Colorado. Water from the melting snow, and of course a portion of the rainfall, percolates through the porous sandstone of the surface measure, and issues in numerous small springs along the edges of the mesa cañons, their locality being usually indicated by the convergence of trails and the trampled bareness of the vicinity.

✓ *Pastoral Life.*—The region is specially adapted for sheep culture, and the Navajo equally well adapted for shepherds, coinciding circumstances which have happily influenced their destiny, transforming them wholly into a peaceable, pastoral tribe. Every family is possessed of a flock of sheep and goats and a band of horses, so that the condition of the tribe is not only far removed from hardship, but is really that of comparative affluence.

To maintain the flocks in sufficient pasture they move them to different grazing grounds at least twice a year, sometimes oftener, these movements being regulated by the condition of the grass and the supply of water. In a dry season many of the smaller springs cease to flow, and besides that, when flocks are held too long in one place, their close cropping destroys the vegetation, enforcing an abandonment of the locality for two or three years, by which time, if left entirely alone, the grasses again recover. The usual practice is to take the flocks up to the higher plateaus and mountains in summer, grazing in the neighborhood of springs or an occasional rain pool, and moving down to the valleys and lower wooded mesas in the winter, when both sheep and shepherds depend, to a great extent, upon the snow for their water supply. By this means they are able to partially utilize the pasturage in the broad waterless valleys, retiring as the summer advances to the grassy uplands that have been fertilized by the melting snow.

This shepherd's life, of course, prevents them from dwelling in large communities; perhaps some desirable watering place may be occupied by as many as ten or twelve families, usually of the same kindred, but commonly fewer than that number frequent the same locality, and it is rare to see more than three or four huts together. A few of the larger cañons containing small streams and patches of arable land are occupied permanently; one of these, called the Tse-yi, is famous for the numerous ancient dwellings in its cliffs,

its peach orchards, and other memorials of its former house-building occupants. This is a specially attractive summer resort, and is the scene of many festive concourses, scattered members of the different families gathering there from every part of the reservation to feast together for ten days or a fortnight upon green corn, water-melons, and peaches.

Aside from the cañon localities the spot chosen for a dwelling place is either some sheltering mesa nook or southward hill slope in the edge of a piñon grove, securing convenient fuel, and not too far from water. But the Navajo seldom lives very close to a spring, a survival of an old habit of their former hunting life when they kept away from the springs as much as possible so as not to disturb the game when coming to water. This choice of secluded dwelling place is apt to mislead a stranger who might cross the reservation and deem it quite unoccupied; and yet it is estimated there are upwards of 15,000 persons within its limits.

But likely enough a family may be met moving with their flock of sheep and herd of ponies to fresh pasture. The *hos-teen*, as the head of a family is conventionally called, drives before him the band of ponies, which, as a rule, are a degenerate lot of "scrubs," small bodied, big headed, and ungainly. He carries a bow and quiver of arrows slung at his side, and probably a rifle and revolver, for the coyotes, and now and then a wolf, make havoc among their sheep, and against these depredators they now resort to the more effective modern weapons. He carries on his saddle two or three blankets and a buckskin or two, but is not very heavily loaded, as he has to chase the straying ponies and keep them to the trail. Following hard behind comes the bleating flock of sheep and goats, meandering and nibbling as they are urged slowly along by the dust-grimed squaw and her children. Two or three of the more tractable ponies carry burdens of household gear stuffed in buckskin pouches and blankets; a bag or two of corn; a bundle of washed wool, and the primitive weaving apparatus; baskets and wicker water-bottles, and often a little imp of two or three years will be perched securely on top of the miscellaneous pyramid. Three or four dogs are an invariable accompaniment of such a caravan, sorry looking curs, but invaluable helpers to the children while herding the flocks.

✓ *Land Tenure.*—These changes to fresh pastures occasionally lead a family to a neighborhood in which they have never lived before,

for the constant increase of their flocks necessitates wider movements than formerly.

The springs and waters are generally regarded as common property of the tribe, but the arable spots in their vicinity are distinctly held by individuals as real property. The flocks of these families consume all the surrounding pasture, so that virtually many of the waters are held as family property by the people who live nearest them. But in fact the extremely limited water supply of the region has grown to be of the gravest concern to the Navajo, and speedily they must either construct artificial reservoirs or curtail their flocks.

In an earlier time, when the organization of the gentes or clans was more compact, a scope of country was roughly parceled out and held as a clan ground, and many of the clans take their names from these localities. Vivid traditions are still extant of those early times before the Spaniard brought sheep and horses to their land, when they lived on the spoil of the chase, on wild fruits, grass seeds, and piñon nuts. Indian corn, however, was known to them apparently from the earliest times, but while they remained a mere hunting tribe they detested the labor of planting. But as their numbers increased, the game, more rigorously hunted, became scarce, and to maintain themselves in food necessity forced them to a more general cultivation of corn and the regular practice of planting became established among them.

There are now no defined boundaries of these ancient clan grounds, but they are still in a vague way recognized and spoken of as "my mother's land," for the Navajo traces his ancestry only through his mother. Families cling to localities and accustomed sections not very far apart, and when compelled to move their flocks to a strange neighborhood they do not seek it as a matter of right, but of courtesy, and the movement is never undertaken until after satisfactory arrangements have been effected with the families already living there.

✓ *Primitive Architecture.*—These matters adjusted, when the family arrives the husband's first care is to build a dwelling, so he chooses a suitable place, and all the neighbors come to help him.

They have two distinct types of dwellings, the bough arbor for summer and the earth-covered hut for winter, the former for temporary occupancy merely, but the hut is looked upon as the family home. Many of the summer shelters are extremely primitive, being

mere wind-breaks of rudely piled brushwood; but other forms of more careful construction are common—(1) boughs in foliage set round in a circle near some conveniently spreading cedar trees, which are utilized to form a latticed roof for the enclosure; (2) simple scaffolds framed around with interlacing boughs; and (3) many quaint little sheds made of branches leaning upon a straight pole supported by forked uprights.

Their winter dwellings also display different crude methods. Trunks of stunted cedar and piñon trees, set with their tips leaning together like a tripod, are the ordinary house frame. Another has stout uprights supporting a flat roof of poles, with sloping sides of tree limbs; in another the tree limbs are laid around horizontally, in a circle, tapering at the height of six or seven feet, resembling a large, misshapen beehive. Near some of the water-courses small coverts are dug out in the sandy banks, and in the cañon nooks, where small stones are plenty, huts with low, rough walls are occasionally built.

Six forms of the picturesque summer bowers and six of the earth-covered winter dwellings are recognized, each form being known by an appropriate name, but they hold no tradition that they ever lived in caves or skin lodges.

✓ The typical Navajo dwelling is the *hogan*,* a conical structure of tree trunks and limbs, covered with earth till it looks like an irregular, dome-shaped mound; but it is not by any means thrown together at hap-hazard, for every detail is traditionally prescribed, and the process may be condensed as follows: First, a circle of the required size is slightly excavated to secure additional interior space and a level floor. Three short piñon trees are trimmed, leaving a wide fork at the small end: these are interlocked to form the apex, with the extended butts resting just on the outside of the circular hollow, one end pointing to the south, one to the west, and the other to the north. Two long, straight limbs are laid upon the east side, their smaller ends resting upon the apex, the butts diverging about three feet apart. Two small forked uprights, supporting a horizontal stick about four feet from the ground, are set at the butts of these straight limbs to form lintel- and door-posts, great care being taken to have this doorway face directly to the east. Stout poles and branches are laid closely around between the main timbers,

* The *h* is pronounced as *ch* in German *ich*.

the smaller ends leaning upon the forked apex, and the spreading butts enclosing the circle. A covered projecting doorway is made of straight boughs resting upon the rude door lintel and another stick laid across the two straight limbs which define the entrance. This cross-piece rests about three feet below the apex, which space is left open for a smoke exit, and the doorway thus projects from the east side of the hogan like a dormer window. In cold weather the entrance is closed with a blanket or a skin suspended from the door lintel. Cedar bark is laid over the entire structure, which is then deeply covered with earth. There is no prescribed size for a hogan, but the average dimensions are about seven feet high at the apex and fourteen feet in diameter. This uncouth hut may scarcely be called comfortable; at best it is merely warm and habitable.

House Dedication.—Soon after the completion of a hogan a “house-warming” or dedication is invariably held, which ceremony partakes much of the nature of a religious duty, the presence of a priest, or shaman, being indispensable, and a good round fee is always paid him in sheep, ponies, or other Navajo effects.

The gods are said to have made the first hogan in the form of a dome; from east to west it was spanned with rays of morning and evening sunlight, and from north to south with the arching beams of the rainbow. The Navajo still maintains the form of this mythic hut, and the peculiar virtues deemed inherent in the primal elements and the blessings of the gods who made the first dwelling are still invoked in their “house-songs.”

A convenient time is chosen shortly after a hogan has been completed, and all the neighbors and friends of the family are invited to attend its dedication. The lonely spot grows animate with a gathering throng as the guests come scampering in upon their wiry ponies. In the distance these mounted groups lend the needed color tints to a scenery otherwise apt to be sombre; the scarlet mantles and feathery plumes of the men, the blue tunics of the women, the glitter of silver ornaments and gaudy trappings, are vividly displayed against the dull gray stretches of sagebrush. But on close approach the individual stands confessed in very grotesque array; incongruous odds and ends of the white man’s clothing sit ill upon him; a fastidious onlooker would pronounce them ill smelling and dirty, and although the men are robust and the women comely, still they show at their best as figures in the landscape.

Family friends and acquaintances meet and exchange greetings ; the older men squat around under the trees and discuss their mutual affairs ; the young men gather in groups to gamble, and the women prepare food for the night's feast. Fires are lit and sheep are slaughtered and dressed, ribs are skewered on saplings to roast before the fire, and haunches are spitted for broiling on the embers.

Shortly before sunset the housewife grinds some white corn into meal, which she places in a shallow saucer-shaped basket and hands to her husband. He enters the hut, and beginning on the left-hand side of the doorway, thence passing to the south, he successively rubs a little of the meal on each of the principal timbers of the house frame. As he does this he mutters a low prayer to the gods who made the first house ; that the timbers may never break and fall upon the inmates ; that they may enjoy health and live long beneath them ; that food may always be in plenty there ; that they may cover increasing possessions, and that ghosts, evil dreams, and all other malign influences may never enter the dwelling. He then sprinkles meal in a circle around the interior, asking the protection of the deities at all the cardinal points, and, going out, he returns the basket of meal to his wife, who then enters, carrying the basket and some firewood. She makes a fire near the center of the hut, and as it begins to burn she sprinkles an offering of meal upon it, and very devoutly utters her traditional prayer :

Burn serenely, my fire.
May peace surround my fire.
My fire prepares my children's food ;
May it be sweet and make them happy.

All now gather within the hut and squat around upon sheepskins spread on the floor, and the women, after setting food vessels among the men, huddle together by themselves upon the north side of the floor space. All help themselves from the jars and basins by dipping in with the fingers ; the mutton is broken in shreds and the bones are gnawed and sociably passed from hand to hand. When the feast has been finished and the pots set outside for the dogs to lick, tobacco is produced and cigarettes of corn-husks are rolled, and while every one smokes good-natured jokes and gossip prevail. Presently the "old man of the songs," as the shaman is called, takes his seat under the west timber so as to face the east,

and, shaking his rattle, he begins the following first "song of the house":

Rising Sun ! when you shall shine,
 Make this house happy.
Beautify it with your beams ;
 Make this house happy.
God of Dawn ! your white blessings spread ;
 Make this house happy.
Guard the doorway from all evil ;
 Make this house happy.
White Corn ! (the Spirit of) abide herein ;
 Make this house happy.
Soft Wealth !* may this hut cover much ;
 Make this house happy.
Male (heavy) Rain ! your virtues send ;
 Make this house happy.
Corn Pollen ! bestow content ;
 Make this house happy.
May peace around this family dwell ;
 Make this house happy.

The song is joined in by all the men, but the women never sing at social or religious gatherings, although they sing really beautiful songs when a few of them get together by themselves, and they sing very sweetly, for the Navajo women have remarkably soft, pleasant voices. In these ceremonial songs all the men join as a matter of course, and right lustily and vigorously. It is also quite common to hear a primitive style of part singing, some piping in a curious falsetto, others droning a sonorous bass, and not altogether without some approach to harmony. There is considerable melody in some of their tunes, but most of them are spoiled by being pitched at the very top of the voice. The old shaman acts as leader, each shaman having his own group of traditional songs, fetiches, and particular ceremonies, and after he has started a song he listens very closely to hear that the right words are sung.

After singing to the east, other songs are sung to the south, west, and north. These are all in strains very similar to the first one, but as the Navajo assigns different groups of deities to each of the car-

*That is, all articles made of soft materials, as skins, blankets, etc.

dinal points he petitions for different blessings from the different directions. Thus to the west he sings to a mountain deity that the yellow light of sunset may imbue his dwelling with its beautiful influence; that the spirit of yellow corn may sit in his hut; that it may cover much "hard wealth," such as weapons, utensils, and silver and shell ornaments; that the "young rain" (meaning mild showers) may fall around his dwelling. The heavy rain is regarded as the male rain and the gentle showers as the female, and both kinds of moisture are deemed necessary to fertilize. Altogether thirty-two of these songs are sung, and their singing is so timed that the last one ushers in the first gray streaks of dawn, and the visitors then gather in their horses and ride home.

Family Customs.—By common consent the house and all of the domestic gear belong entirely to the wife; the husband owns a few blankets, his saddle and horse trappings, his weapons, ornaments, and other small articles stowed in his own buckskin bag, but all else that the house covers is supposed to belong to the wife. If she does not already possess a corn-field by inheritance or purchase, the husband must plant one for her. Of course she assists in the planting; the man hoes the ground and she drops the seed, but he constructs the rude fence of brush and tree branches. He also plants and takes care of his own corn-field, which may probably be in quite a different locality from his wife's. Where a man has more than one wife, for polygamy is common, it is incumbent upon him to do all of the heavy field-work for them, or to hire it done by some of the young men. The wife owns her own sheep and horses and marriage gives the husband no claim upon them. Aside from her kitchen duties, she has her vertical loom suspended under some convenient tree, where she spins her choice wool and weaves blankets and her own dresses. The children and "younger brothers" usually herd the sheep and the man's principal care is the horse herd.

The popular conception of the Indian squaw in thralldom will not at all apply to the Navajo women; the children belong to her wholly, and she has the entire control of the house life. Occasionally, to be sure, some surly reprobate maltreats his wife, but these outrages are usually followed by a demand for reparation by the woman's family, and this consideration restrains many a gust of passion.

Parents display the fondest affection for their children, rarely resorting to punishment. Members of a family hold one another in

warm regard, and ties of kindred are observed, even to the remote collateral branches, which in civilization have long ceased to be recognized.

Deference is shown to the chiefs and their advice is generally followed, yet there is no real authority inherent to the chiefship. Their laws consist of taboos, religious or superstitious observances, and ancient customs. The two former are still rigidly adhered to, but the latter have lost much of their former consequence, and the younger people are apt to construe them to suit their own convenience. Theoretically they have many punitive and retaliatory laws, but they are now seldom enforced. An essential condition of primitive social life is still very marked among them, namely, the habitual deference of the younger to the elder, and this estimable rule is the effectual binding link of their crude society.

Costumes.—Their typical dress has been almost obliterated since the advent of the trader among them, but as the Navajo now appears he may thus be sketched: Hair all drawn smoothly to the back of the head and done up into a compact club or cue of hour-glass shape; a red silk sash worn as a turban and decorated with feathers and silver ornaments; large silver ear-rings and heavy necklaces of coral, thin discs of white shell and turquoise, and strings of globular silver beads and other ornaments of their own manufacture; a loose sack or short shirt of bright-colored calico, and loose breeches of the same material; belts consisting of large heavy discs or oval plates of silver strung upon a strip of leather are worn both by men and women; low moccasins of buckskin, soled with rawhide, surmounted with leggings of dyed deerskin, which are secured with garters woven of thread in fanciful designs. There is little or no difference between their summer and winter dress, and they constantly wear a heavy woolen blanket as a mantle. Firearms have displaced the bow and arrow, although formerly these were an essential part of every-day costume. A curious relic of the habitual use of the discarded weapon alone survives in their fashion of still wearing the silver-mounted leather wrist-guard as an ornament.

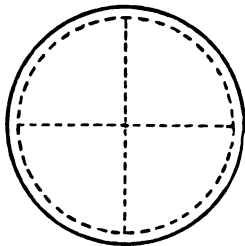
Like the men, most of the women wear calico; their dresses made in the simple fashion, of a loose jacket and short petticoats; but, differing from the men, each of them possesses the typical Navajo woman's costume, which she wears on all ceremonial occasions. The hair is dressed exactly the same as the men's, but no headgear is

ever worn. The ears of the women are pierced, but they never wear ornaments in them now, and this peculiarity is explained in a curious way by the men. They say that the infidelity of their women is notorious, and that formerly when married women wore ornaments in their ears, an injured husband punished an unfaithful wife by tearing them through the ear lobes. Now when a girl is married she takes the ornaments from her ears and wears them hanging from her necklace. Besides their necklaces, which are similar to those of the men, they also wear numerous silver bracelets, bangles, and finger rings. The typical dress is a heavy woolen tunic of dark blue, with wide designs in scarlet along the borders; it reaches just below the knee and is confined round the waist with a woven girdle. It consists merely of two pieces of the required size, sewed with yarn at the sides from the bottom hem to the waist, and the upper corners tied together at the shoulder, but the young women now generally wear a calico dress under this rough tunic. The moccasin is shaped just like the men's, but fastened to the back part of the upper is the half of a large buckskin, which is wrapped around the leg in regular folds from ankle to knee, and on the outside of the leg with a row of silver buttons. The women also wear a blanket as a mantle, but it is lighter, of brighter-colored wools, and more elaborate in design than those worn by the men. The women dress their children in miniature of the adult costumes.

✓ *Marriage Customs.*—Polygamy is very general; a few men have four or five wives, quite a number have three, but two may be said to be the polygamous custom. It is difficult to estimate, but probably about a third of the male adults are polygamists. Girls are betrothed at a very early age, and some are married while yet mere children, but as a rule the marriageable age may be set from twelve to fourteen. The typical marriage between two young persons is arranged by their families, the elder brother of the bride's mother setting the value of the presents, which the bridegroom's people must give the bride's family, ranging from five to fifteen horses.

✓ On the night set for the marriage both families and their friends meet at the hut of the bride's family. Here there are much feasting and singing, and the bride's family make return presents to the bridegroom's people, but not, of course, to the same amount. The women of the bride's family prepare cornmeal porridge, which is poured into a saucer-shaped basket. The bride's uncle then

sprinkles the sacred blue pollen of the larkspur upon the porridge, forming a design as in the accompanying figure. The bride has hitherto been lying beside her mother, concealed under a blanket, on the woman's side of the hut. After calling her to come to him, her uncle seats her on the west side of the hut, and the bridegroom sits down before her, with his face toward hers, and the basket of porridge set between them. A gourd of water is then given to the bride, who pours some



of it on the bridegroom's hands while he washes them, and he then performs a like office for her. With the first two fingers of the right hand he then takes a pinch of the porridge, just where the line of pollen touches the circle of the east side. He eats this one pinch, and the bride dips with her fingers from the same place. He then takes in succession a pinch from the other places where the lines touch the circle and a final pinch from the center, the bride's fingers following his. The basket of porridge is then passed over to the younger guests, who speedily devour it with merry clamor, a custom analogous to dividing the bride's cake at a wedding. The elder relatives of the couple now give them much good and lengthy advice, and the marriage is complete. After this many songs, which are really prayers, are chanted and sung by all the men, and the lips of the women may be seen moving as they repeat these song-prayers, but they give no utterance to the words.

While these songs are in progress the newly-married couple contrive to steal away unobserved to a hut which the bridegroom has previously prepared.

✓ *Taboos.*—A taboo now lies between the bride's mother and her son-in-law, and from the marriage night henceforth they must never look each other in the face again. Several other taboos are also rigidly observed; they must never touch fish, and nothing will induce them to taste one; their forests abound with wild turkey, but they are strictly forbidden to eat them; bears are quite numerous, but as they are also taboo they will not even touch a bearskin robe; nor must any one plant a tree; and the flesh of swine they abominate as if they were the devoutest of Hebrews. The wood of the hunting corral in which they trap the antelope is also tabooed.

They observe many curious ceremonies before and during a hunt, and all of the tree limbs forming the hunt corral are held as having been sacrificed to the hunting deities. Not only do they abhor food cooked on a fire of wood obtained from these enclosures, but they also keep at a distance from such a fire, dreading to feel its warmth or inhale its smoke.

There are also other social taboos. A man cannot marry a woman of his own clan, nor may brother and sister touch one another nor even receive anything directly from each others hands. Thus, if a sister wishes to give her brother an article, she places it on the ground and he picks it up. The origin of these singular customs is very obscure, and although for some of them very judicious reasons are assigned, yet they all rest upon vague and inadequate traditions. The most embarrassing of them all, however, is the tabooed mother-in-law, as it is the custom for the husband to live among his wife's people, and the commonest sounds in a Navajo camp are the friendly shouts, warning these marriage relatives apart.

Common Arts.—Weaving is entirely a woman's art with the Navajo, and they weave blankets and mantles, rugs and saddle-cloths of native wool and also of yarn bought from the trader; they are of endless variety in quality, texture, and design, and although it may be said they all bear a common resemblance, yet no two of them are exactly alike. The principal designs are emblematic, yet the weavers do not hold themselves closely bound to these conventions, but freely follow their own conceits as fancy leads them; each fabric thus holds an individuality of its own. They also weave their own dress material, girdles, garters, and hair-bands, these latter for tying up the cue at the back of the head. They also make their own dyes of vegetable matter, gums, and ochres in colors black, blue, red, and yellow. The older women still make cooking utensils of pottery, but the young women no longer practice the art. The iron camp-kettles and tin cups and coffee pots brought in by the trader are rapidly displacing the primitive gourd ladles and earthen jars. They also make saucer-shaped water-tight baskets and wicker water-bottles, coarse in texture but of elegant model.

Some of the men work in a rude way in iron and silver, fashioning bridal and personal ornaments; and all of them can dress

skins and make their own shoes and leggings, their own articles of dress, and horse trappings; but aside from these the men have no arts and, fortunately, they never acquired any knowledge of making an intoxicating liquor.

Mythology.—Their mythology is exceedingly complex and equally difficult to comprehend or to define. Their religious practices are mystic to obscurity, and within these limits it is almost hopeless to attempt treating this subject intelligibly.

Before the present world there were four others of which they have traditional story. The first under-world was far down in the "below," in the heart of the earth, and "First-man" and "First-woman," superhuman beings, always existed there. From pellicles of skin which they rubbed from different parts of their bodies they made eight other superhuman beings and animal monsters, and placed two at each of the cardinal points. Thus, at the east, Te'-hol-tso-di (a horned water monster) and E'-dit-ni (thunder); south, Tchalh (frog) and Te-hlí'ng (horned horse), who was also a water monster; at the west, Ish'-een-es-tsun (salt woman) and Tho'-ne-ni-li (water sprinkler, a youth); north, Túlth-k'le-ha-le (a swan-like monster) and Sis-tye'lth (tortoise). One man and one woman, the *first of the human family*, were also produced in the earliest under-world from pellicles of skin, as were also the first of animal kind, which, curiously enough, were locust, red ant, and horned toad.

These beings quarreled, and the water monsters caused a deluge. First-man made a raft of reeds, and by this they all floated to the roof, where Locust bored a hole through which they all ascended to the second world. Similar incidents, vague, weird, and inconsistent, occur in the succeeding worlds, a final flood compelling the ascent of the greatly increased human family to this present world. This they reached by entering a giant reed, which grew through the roof of the fourth world in a crevice opened by Badger, Rabbit, Bear, and all other animals that burrow in the ground or make lairs in the cliffs, all of which preceded the human family through this orifice. This place where they came up is called the Ha-d'ji-nai, and is said to be situated in southeastern Utah, but no Navajo has ever seen it. All mankind came up at the same time and place, and the gods distributed them over the face of the earth.

The popular deities now most generally appealed to are those in

the east, presiding over the dawn and the white light of day; in the west, to the deity who distributes the yellow light of sunset and who is also the hunter's patron. In the distant west, across the great water, is a very beneficent goddess called Es-ts'un n'ut-le-hi (woman metamorphic). Every evening she has grown old and feeble and every morning she resumes her state of maidenhood. The twin sons of this goddess, "The child of the waters" and "The slayer of alien gods," who frequent the six sacred mountains surrounding the Navajo land, are also important factors. The sun and the moon, the "Blackness of the above," which is regarded as the genius of fecundity, and the female spirit of the earth, and many other minor deities are all frequently petitioned. They hold no conception of a universal or controlling spirit, and their deities are not spiritual, but grossly material genii of localities, with limited attributes and functions.

The cardinal points have emblematic colors, and when enumerated it is always in the sequence: east (white), south (blue), west (yellow), north (black).

Religious Ceremonies.—The most important religious ceremonies are only celebrated during the winter, in the season when the snakes are asleep, as they have it; but aside from this limitation there are no specified times nor any regular succession of religious feasts. All their religious observances are either for the cure of disease or relief from sorcery, and their character and extent are determined by the patient and his people, who bear all the expense attending them. When a person falls ill or deems himself under a spell he and his friends decide upon which priest or shaman they shall summon. Each of these shamans, priests, or medicine-men, as they are indifferently designated in English, has his own particular songs and rites and his own scale of fees for attendance. If the patient is wealthy, he may decide to give the grand "mountain chant" * or "nine nights' song," and engage all the shamans of his region.

Upon the floor of the song or medicine lodge very elaborate sand mosaics are prepared, depicting mystic emblems, and groups of various deities, the details and costumes being very skillfully por-

* See W. Matthews' "Mountain Chant of the Navajos" in Ann. Rep. Bu. Ethnology for 1883-'84.

trayed in many-colored sands, charcoal, and ochres. During the ceremonies the patient is sprinkled with the colored pulp taken from the mosaic upon which he is seated, and at their conclusion it is entirely obliterated and the sands carried off and scattered. At night, while these observances are in progress, processions of masked and painted dancers, songs, and curious feats of magic take place in large bough enclosures, lit up with great bonfires, as all of their public ceremonies are held only after night-fall, between dark and daylight.

The deities are invoked not only to relieve the patient at whose instance the feast is given, but also any others present similarly afflicted. Rains and good grass for the flocks and bounteous favors to all the people are sung for, many of the episodes being vividly dramatic and impressive. These gatherings are also availed of for social intercourse, amusement, and mutual rejoicing.

Medicines.—They hold that all sickness is caused either by evil ghosts, sorcery, disregard of taboos, or neglect of fetich rites; hence the office of the shaman is really that of a priestly exorciser. In the proper sense of the term they have no medicine, although many herbs and other substances are used, but entirely without intelligence.

They bleed by incising with sharp fragments of obsidian, but metal must never be used. They practice administering medicines vicariously, as, for instance, to a well husband for a sick wife, but they firmly believe that more virtue attaches to the rattle and songs of the shaman than to any of the materials prescribed.

Their sweat-house is a miniature hogan, just large enough to cover a man when squatted on his heels. When used, hot stones are rolled into it, and the aperture is tightly closed with blankets. No water is thrown upon the stones, but the patient is filled with all he can drink, and on emerging he is, commonly, scoured dry with sand. It is really of great sanitary value, although probably more sick persons are killed than cured, through ignorance of its proper use.

Present Transitional Condition.—The Navajo cannot be classed with the ordinary "Agency Indians," as they are in no sense dependent upon the Government, but are entirely self-sustaining. More than twenty years ago, after a long period of hostility, they were subdued by troops, and an agency reestablished which has been maintained ever since. At that time it is probable they would all have perished had it not been for the Government aid received. Now,

however, the great bulk of the tribe never go near the agency unless it be on the occasion of an issue of wagons or farm implements.

They are in a very interesting stage of transition, and clearly one of very material progress. The men have adopted modern tools and discarded the primitive appliances in all their common arts. The women still cling to the traditional methods in their special arts of spinning, weaving, basket-making, and pottery, but in the kitchen the ordinary utensils of civilization are forcing the crude pottery vessels into disuse. For the cumbrous wooden hoes and planting sticks modern implements have been substituted, thus enabling them to plant a greatly increased acreage. The proximity of trading posts, as has been mentioned, has radically transformed their original costumes and modified many of the early barbaric traits, and also affords them an excellent market for their wool, pottery, blankets, and other products.

Bright calico and Mexican straw hats are now their ordinary summer attire, and they take kindly to our comfortable heavy garments in cold weather. Firearms have almost entirely superseded the primitive weapons; silver ornaments of their own manufacture have displaced those of copper and brass; the glass beads of earlier days are now regarded with contempt, and valuable coral necklaces have become the fashion.

But perhaps the most promising indication of their steady advance toward civilization is displayed in their growing desire to possess permanent dwellings, and many of them have already built for themselves comfortable two-roomed stone cabins. The steady growth of their wealth, in the constant increase of their flocks and herds, insures the continuance of this upward movement.

A judicious law might be made whereby they could legally hold their present grazing grounds, for in this arid region of scant vegetation a wider scope than elsewhere is necessary for pasturage, and, as most of their land lies at an altitude of over 6,000 feet, only a very small portion of it can ever be brought under cultivation. Were they thus guaranteed against interruption, judging from the rapid progress they have made during the last fifteen years, it is presumable that in a comparatively short time they will win their own way to a respectable social condition.

A-WA'-TO BI:**An Archeological Verification of a Tusayan Legend.***

BY J. WALTER FEWKES.

About the close of the year 1700 a large Tusayan pueblo called A-wa'-to-bi was tragically destroyed, so that since that time a ruin only marks its former site. Written history is silent in regard to the details of the event, but there still remains among the descendants of the actors in that destruction a legend of the deeds of that stirring time.† The present article is an attempt to demonstrate by archeological evidence the truth of that legend.

In the summer of 1892 I passed ten days in camp at the Tusayan ruin called by the Hopi, A-wa'-to-bi, "the place of the Bow People;" by the Navajos, Talla-hogan, the "Singing House." At that time, accompanied by Mr. A. M. Stephen, I made a reconnaissance and a few excavations in order to acquaint myself with the ruin, but I was particularly anxious to test the story of its destruction still repeated by the Hopi, and to gather from archeological researches whatever data could be found to shed light on the disaster which overthrew one of the most populous of the Tusayan pueblos about two hundred years ago. The following pages give some of the results of my cursory examinations.

The historical accounts of the destruction of A-wa'-to-bi, as seen by the following quotation from Bandelier, are very meager.‡ "The only document which I found," says this learned author, "in which detailed reference is made to the slaughter of Ahuatuyba is a *Parecer* of the clergy of New Mexico, bearing date 1722. In it the destruction of Ahuatuyba is explicitly stated. There existed at Santa Fé, in 1713, a collection of testimonies taken on the occurrence, and described as follows: '*Yten vn Quaderno de autos sobre la notisia de lo susedido en el pvo de Aguatubi de la proa de Moqui autorisadas de Pedro de Morales en 63 fojas.*' It is mentioned in *Ymbentario de los*

* This work was done in the summer of 1892, while connected with the Hemenway Expedition.

† See Bourke: "Snake Dance of the Moquis of Arizona."

‡ Part II, Final Report, Papers of the Archaeological Institute, p. 372, 1892.

Papeles que se hallan en el Archivo del Cabildo justitia reximiento de esta villa de Santa Fé, 1713, MS." According to the same investigator, the Hopi destroyed A-wa'-to-bi about the end of the year 1700 or the beginning of 1701, but he was unable to tell the exact date, as nearly all the papers relating to the administration of Cubero have disappeared from the archives of Santa Fé, though enough remain to prove the probable accuracy of the Hopi version as presented by Bourke.

Let us first turn to the Indian legends of the destruction of A-wa'-to-bi as a supplement to the imperfect historical notices at present in print. The variants of this legend which have been published by Bourke and by Mindeleff are in the main very similar to the legend of the destruction of A-wa'-to-bi which I have heard in fragments from several Indians, both in Walpi and while camped on the site of the ruin. The following version, however, obtained for me from Sa'-li-ko* by Mr. A. M. Stephen, enters more into the details than any yet printed:

*Destruction of A-wa'-to-bi as related by Sa'-li-ko (1).—*Wi'-ki (2) and Si'-mo (3) and the other chiefs have told you their stories, and surely their ancestors were living here at Walpi when A-wa'-to-bi was occupied. It was a large village and many people lived there, and the village chief was called Ta-po'-lo, but he was not at peace with his people and there were quarreling and trouble. Owing to this conflict only a little rain fell, but the land was fertile and fair harvests were still gathered. The A-wa'-to-bi men were bad. Sometimes they went in small bands among the fields of the other villagers and cudgeled any solitary workers they found. If they overtook any woman they ravished her, and they waylaid hunting parties, taking the game, after beating and sometimes killing the hunters.

There was continued trouble in A-wa'-to-bi, and Ta-po'-lo sent to the Oraibi chief, asking him to bring his people and kill the evil A-wa'-to-bi.(4) The Oraibi came and fought with them, and many were killed on both sides, but the Oraibi were not strong enough to enter the village and were compelled to withdraw. On his way back the Oraibi chief stopped at Walpi and talked with the chiefs there. Said he: "I cannot tell why Ta-po'-lo wants the Oraibi to

*Sa'-li-ko belongs to the Pū-nañ'-nyu-mū, one of the Cactus gentes of the Snake phratry of Walpi, and this is the story she tells as to how she became Ma-zrau'-mon-wi (chief of the Ma-zrau' Society), and how that hereditary office came into her family from an ancestor saved at the destruction of A-wa'-to-bi.

kill his folks, but we have tried and have not succeeded very well. Even if we did succeed, what benefit would come to us who live too far away to occupy the land? You Walpi people live close to them and have suffered most at their hands; it is for you to try." While they were talking Ta-po'-lo had also come, and it was then decided that the chiefs of all the villages should come together at Walpi to consult. Couriers were sent out, and when all the chiefs had arrived Ta-po'-lo declared that his people had become *po-wa'-ko* (sorcerers), and hence should all be destroyed.

It was then arranged that in four days large bands from all the other villages (5) should prepare themselves and assemble at a spring not far from A-wa'-to-bi.

A long while before this, when the Spaniards lived there, they had built a wall on the side of the village that needed protection, and in this wall was a great, strong door. Ta-po'-lo proposed that the assailants should come before dawn and he would be at this door ready to admit them, and under this compact he returned to his village. During the fourth night after this, as agreed upon, the various bands assembled at the deep-gulch spring, (6) and every man carried, besides his weapons, a *ko-pi'-tco-ko* (torch) and a bundle of greasewood. Just before dawn they moved silently up to the mesa summit, and, going directly to the east side of the village, they entered the gate, (7) which opened as they approached.

In one of the courts was a large kib-va, called Pü-vyüñ-o-bi,* and in it were a number of men engaged in po-wa'-ko rites (8). The assailants at once made for the kib-va, and, plucking up the ladder, they stood around the hatchway shooting arrows down among the entrapped occupants. In the numerous cooking-pits fire had been maintained through the night for the preparation of food in a feast upon this appointed morning, and there they lighted their torches. Great numbers of these and the bundles of greasewood being set on fire were then cast down the hatchway, and firewood from stacks upon the house terraces was also thrown into the kib-va. The red peppers (9), for which A-wa'-to-bi was famous, were hanging in thick clusters along the fronts of the houses, and these they crushed in their hands and flung upon the blazing fire in the kib-va to torture their burning occupants. After this, all who were capable of moving were compelled to travel or drag themselves till they came

*A term, according to Stephen, derived from the plural of po-wa'-ko.

to the sand-hills of Mi-coñ'-iñ-o-vi and there the final disposition of the prisoners was made.

My maternal ancestor had recognized the Ma-zrau'-moñ-wi and saved her at a place of massacre called Mas'-ki, and now he asked her whether she would be willing to initiate the women of Walpi in the rites of the Mam'-zrau. She complied, and thus the observance of the ceremonial called the Mam-zrau'-ti came to Walpi. I cannot tell how it came to the other villages. This Ma-zrau'-moñ-wi had no children, and hence my maternal ancestor's sister became chief and her badge of office or ti'-po-ni came to me. Some of the other A-wa'-to-bi women knew how to bring rain, and such of them as were willing to teach their songs were spared and went to different villages. The Oraibi chief saved a man who knew how to cause the peach to grow, and that is why Oraibi has such an abundance of peaches now. The Mi-coñ'-iñ-o-vi chief saved a prisoner who knew how to make the sweet so-wi'-wa (small-eared corn) grow, and this is why it is more abundant here than elsewhere. All the women who had song-prayers and were willing to teach them were spared and no children were designedly killed, but were divided among the villages, and most of them went to Mi-coñ'-iñ-o-vi (10). The remainder of the prisoners, men and women, were again tortured and dismembered and left to die on the sand-hills, and there their bones are, and the place is called Mas'-tco-mo (11). This is the story told by my old people.

NOTES.

1. Sa'-li-ko is Su'-pe-la's wife, who takes prominent parts in many ceremonials.

2. Wi'-ki, Chief of Antelopes, whose ti'-po-ni (palladium, "mother," of fraternity) he holds.

3. Si'-mo (*obit*, 1892), Chief of the Flutes. The published stories of the destruction were obtained from several sources, but as it adds an element of exactitude to repeat the story of one person, that of Sa'-li-ko is here given. Of course, in repeating the story, since human memory is fallible, errors must be expected, and the personal equation should always be considered. These folk-tales are not mathematically exact, although capable of scientific treatment, and versions vary. For two centuries the story of A-wa'-to-bi has been repeated, and there is little doubt that modifications have been introduced in successive generations.

4. The different causes assigned in the Ho-pi legends for the destruction of A-wa'-to-bi correspond in a general way. Constant quarrels and

bickerings between the pueblos led to repeated controversies, while misunderstandings about boundaries of fields, ownership in springs, and similar disagreements brought on wars which destroyed villages. Sorcery, a dread and deadly cause of murder and destruction, was a most potent factor and, from the legend, would seem to be a primal cause of the overthrow of A-wa'-to-bi. The imaginary or real neglect of these Bow-people* to observe rain ceremonials and the charge that they kept the needed rain from their neighbors by sorcery would be considered offenses worthy of death. Then, too, possibly the ill-fated pueblo had received the Spaniards back, after the great rebellion, more cordially than they should have done, according to the judgment of their neighbors. That in itself, especially if their priests made many converts, as we have reason to think they did from the numbers baptized after the reconquest, might have been a *causa belli*. It is said in several variants of the legend that A-wa'-to-bi was full of "singing men," but I have found none which distinctly states that the acceptance of Christianity was a cause of the destruction, although it seems to me that this may have been the true reason. In considering the causes of the overthrow it is interesting to know something of the kinship of the A-wa'-to-bi people, and we find that some, at least, of the phratries of the fated pueblo were the same as those in the villages of their conquerors. It is, however, a well-established fact that family ties between different pueblos do not imply friendly feeling. According to Mindeleff's account, compiled from Stephen's notes, a part of the Sun people from the east settled at A-wa'-to-bi. The same author speaks of refugees from Si-ka'-ki (now a ruin in the foot-hills to the right of the main road to Hano or "Te-wa") who also went to A-wa'-to-bi and transmitted their feudal wrongs to their descendants. The wrongs of Si-ka'-ki against the Walpi were no less than the destruction of their town, portion of the ground-plans of which are still pointed out. It is also said in Mindeleff's account that the Badger people were found in A-wa'-to-bi, and that the Mag-pie and Field-mouse and portions of the Asa people lived there. There is little doubt but that many peoples were represented in old A-wa'-to-bi, but as our knowledge of their kinship depends upon hearsay and is incapable of demonstration, definite statements must be accepted with more or less reserve. According to Se-ge'-ni, a Navajo who has his house nearest A-wa'-to-bi, the A wa'-ta (Bow), Ho-nan'-i (Bear), Pieb (Tobacco), and Bu-li'-nya-mû (Butterfly) were the gentes which inhabited A-wa'-to-bi. Of these the A-wa'-ta or Bow were the strongest, and they gave the name A-wa'-to-bi to the place. The pictograph of a bow and arrow on the side of the mesa below A-wa'-to-bi may have been made with reference to the former inhabitants, but I much doubt its contemporaneity with the stirring events of the destruction. In one of the excavated chambers I found an arrow-sharpeener upon which was cut a bow and arrow and zigzag figures, the import of which I am ignorant.

* A-wa'-ta, bow; o'-bi, place of.

5. It is almost universally conceded by the Hopi and western Tewa that A-wa'-to-bi was destroyed before the second delegation of the latter came to the east mesa and settled Ha'-no-ki. The first migrators from the Rio Grande region, known as that of the Asa people, were relatives of the Tewa, but were amalgamated with the Hopi and lost their original language.* The ancestors of the present inhabitants of Ha-no, it is affirmed, took no part in the destruction, for they had not then come to the country. Although A-wa'-to-bi has been shunned since its overthrow as po-wa'-ko (wizard) and the story of its tragedy repeated from generation to generation, the ancient shrines of the place were used until a few years ago and portions of the old cult † have been transplanted to the homes of their victors.

It is stated in Mindeleff's account that the attack was made by the men of Walpi, and as a populous neighboring pueblo this town, no doubt, took a prominent part; but there is good reason to believe that the other villages (except Ha-no), especially Mi-coñ'-iñ-o-vi, participated. It is not probable that there was a strong band of union between the other pueblos against A-wa'-to-bi, for the history of these communities indicates little concert of action. The belief that the people of A-wa'-to-bi were sorcerers might have united them, but ordinarily each pueblo was a feudal power in itself and settled its own difficulties.

Judging from the stacks of charred and half-burnt corn on the ear which I found when excavating the ruins, one can hardly suppose that plunder was an object, nor do any of the stories hint at this as a cause. The Walpi people had many grievances against these neighbors, due to the bad character of some of them, and To-po'-la may have used their superstitions to serve his own designs.

6. The spring where the hostiles assembled was indicated to us by Se-ge'-ni, a Navajo who lived near it and who had married a Hopi woman. This spring is possibly the one by which Vargas camped after the baptism of the children of A-wa'-to-bi, in 1692. There is good water nearer A-wa'-to-bi, and a fine spring west of the ruin and south of the burial sand-hills was developed for us while in camp. I agree with Mindeleff (page 50) that the walls of a corral near the spring do not prove that the A-wa'-to-bi people had sheep at the time of its destruction, because the corral appears to me more modern than any of the walls of A-wa'-to-bi, and yet it is probable that the Spaniards had imported sheep into the country at this early date.

7. The gateway lies at the extreme west end of the ruins and is indicated by two stone structures still standing. In its mode of construc-

* According to Stephen. See Mindeleff's "A Study of Pueblo Architecture," in 8th Ann. Rep. Bur. Ethnology.

† See reference to A-lo'-sa-ka, *Journ. Am. Eth. and Arch.*, vol. ii, and description of Mam-zrau'-ti, *Amer. Anthropol.*, July, 1892.

tion and general appearance this gateway resembles the Mission walls. Neither wooden beams nor remnants of a door are visible.*

8. In one account it is said the tragic event occurred in the Na-ac'-nai-ya, which is now celebrated in November. This corresponds with the meager historical data which we have. The cooking-pits are filled and the fires lighted, as a general thing, near the close of the ceremonials. The ceremony of Na-ac'-nai-ya is that of the "New Fire," but the connection of the destruction with any definite festival is very vague.

9. Every one concurs in the statement that red peppers were used. The plain at the foot of the A-wa'-to-bi mesa was reputed to be one of the gardens of Tusayan.

10. Many things support this statement. The Al-o'-sa-ka figurines were especially claimed by the Mi-coñ'-iñ-o-vi people, as I have recorded in the *Journal of American Ethnology and Archaeology*, volume ii, No. i. Families from this village still claim A-wa'-to-bi lands, basing their claim on their relationship to former inhabitants of the pueblo.

11. Mas-tco'-mo is pointed out by the present Hopi, but I have not excavated it to try to find the bones of the unfortunates. The names Mas'-ki (Death House) and Mas-tco'-mo (Death Mound), however, are significant. In some variants of the legend gruesome tales of the cruelties to which the women were submitted at Mas'-ki are told. Most horrible mutilations were made of the persons of those wretched ones who would not go with the captors, and, if the stories are correct, the final butchery at Mas-tco'-mo must have been horrible. The one bright spot in this somber tragedy is that the children were not killed, and that such women as knew the rain songs and prayers were saved. Although it is stated that all of the men were put to death, it is probable that To-po'-la had a following who, it can hardly be supposed, met the fate of those opposed to him, and it would seem incredible that some did not escape in the confusion.

The present trail up the south side of the mesa leads past the southeastern corner of the standing walls of the Mission and crosses the plaza, leaving it near the gateway, as indicated on the map (Pl. I). The ancient entrance to the plaza was probably the same as that now used, and there are indications of a more primitive trail a few yards to the east, alternating foot-holes and hand-rests by which one grasps the side of the cliff as he ascends. These bear unmistakable evidences of use, and can be traced several feet up the almost precipitous sides of the rock. The ruins of high walls on

* This gateway was probably built about the time of the Mission; indeed, the appearance of the ruin of A-wa'-to-bi would seem to indicate that its southern and eastern sides are more recent than the western section and show traces of Spanish influence.

either side of the gap by which one enters the plaza by these trails indicate the former existence of defensive works similar to those found at the west end of Walpi at the present day. The approaches to A-wa'-to-bi from the north and east sides are open and level, with sand dunes, convenient for concealment, not far away. It is probable that the hostiles approached the doomed pueblo from these sides rather than by way of the precipitous trail on the south. Their rendezvous at the spring was conveniently situated behind the sand-hills, and they would naturally wish to avoid the risk of discovery in following the more public trail of the mesa.

Let us now turn to the evidences of the truth of the legend which can be found by an examination of the ruin. The position and general facts of A-wa'-to-bi are mentioned by Bourke, Mindeleff, and Bandelier, but no excavations of the ruin had been made or published up to the time of my visit. The first published identification of A-wa'-to-bi was by Bourke, although it had been recognized by Stephen and Keam before that time. Mindeleff in 1893 (report dated 1891) published an account of the ruin, with map, charts of ground-plan of the eastern part, and valuable views of the walls of the Mission. So far as the author knows, this account is the most complete yet published, but it is confined more especially to the so-called Mission and the chambers near it.*

The mounds which indicate the site of A-wa'-to-bi cover an area about rectangular in shape, the length being about double the breadth. Their greatest extension is not far from east and west along the southern edge of a high mesa. When the walls stood upright those on the western part probably rose almost continuous with the cliffs.

The ruin is naturally divided into an eastern and western part, of which the western seems to be the older. The eastern is better preserved and is almost wholly taken up by the so-called Mission. This portion, with the adjacent ground-plans of rooms, has been described by Mindeleff, to whose account I take the liberty of referring. When seen from the east, the walls of the Mission are prominent objects above ground and seem to lie on the south side of the eastern portion, while on the north side of the same there is a range of high mounds which extends continuously half way along

* In this article I shall not attempt a description of the ruin, as my object is simply to call attention to the facts obtained, in order to verify the Hopi legend.

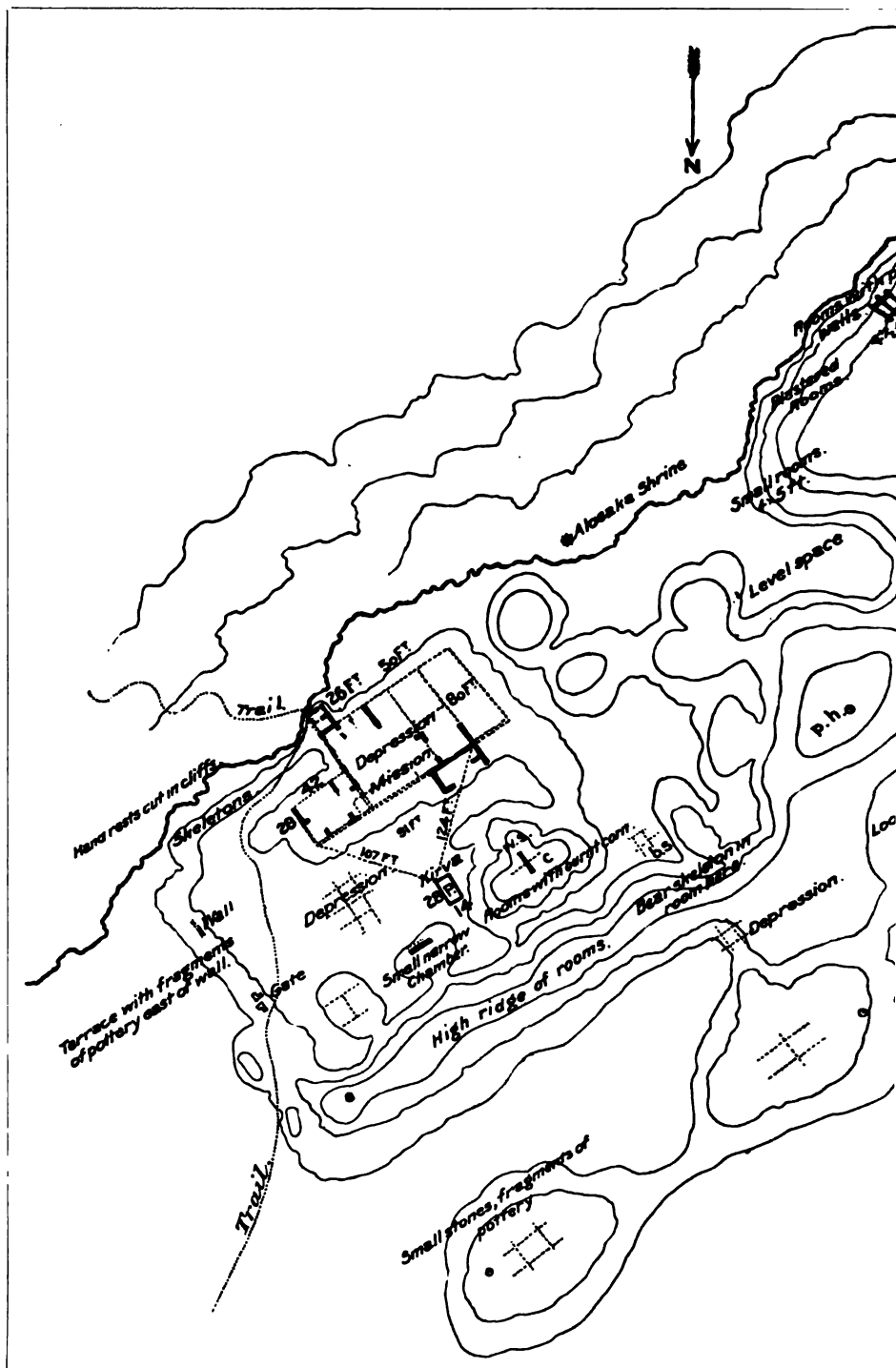
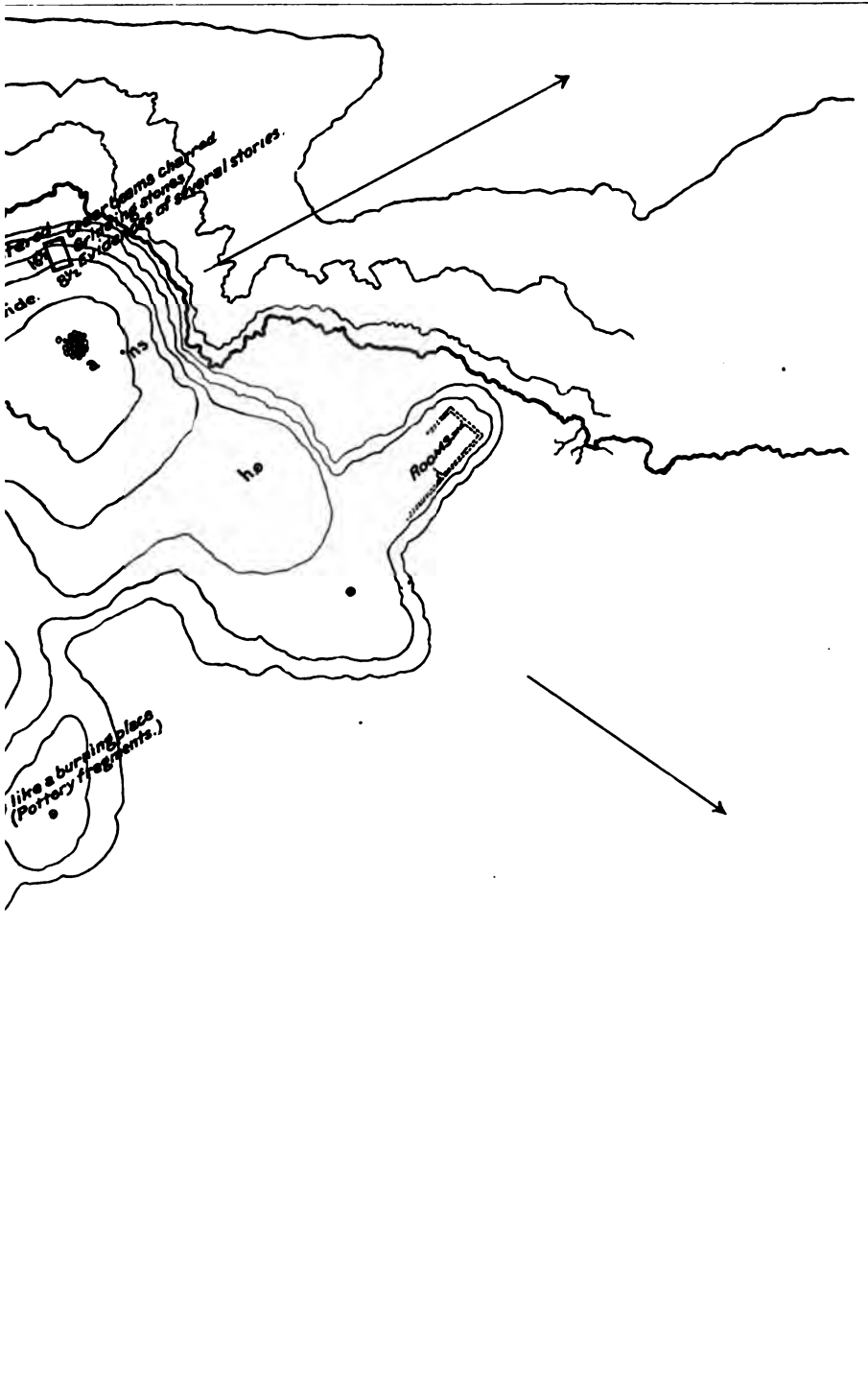


PLATE I.—Map of



the northern border and indicates from its altitude that the rooms at this part were of more than a single story.

In almost every room which was excavated evidences of fire or a great conflagration were brought to light. In some instances the beams had fallen in and were simply charred superficially; in others they were thoroughly reduced to charcoal, but we rarely opened a room without finding the beams and burnt fragments of wood on the floor. The inner walls of many of the rooms were covered with plaster adobe, and the floors were generally paved with flat stones. The mealing troughs or stone slabs where corn was ground were ordinarily in place, and cooking pots and vessels of both coiled and smooth ware were repeatedly found in the rooms of both the eastern and western sections of the ruin.*

The accompanying map (Pl. I) will, it is hoped, give the relative positions of the different rooms excavated, but a brief mention of some of the interesting points about each may have a value.

Room (b. s.) with bear's skeleton.—The chamber in which the bear's skeleton was found was eight feet long; six feet on one side and seven feet four inches on the opposite. The short walls were oriented N. 32° W. The bones were found at the west end of the room. The presence of the bear's skeleton might have been due to the fact that at the time of the overthrow a carcass of this animal was awaiting consumption.

Narrow room (n. s.) west of initial point.—This chamber was inclosed on four sides by walls and measured two feet nine inches by twelve feet six inches. It was at first mistaken for a passage-way, but there was no door connecting it with any other room. Fragments of walls that may have fallen from chambers overhead filled its interior.

Room (w. s.) with window looking south.—This room lies north of the adobe wall of the Mission and measures ten feet by six feet. The window measures one foot nine inches.

Storage-room (c.) with charred corn.—A square room northwest of the po-wa'-ko kib-va had one side filled with charred corn, stacked similarly to the way corn is at present stored in Walpi and Zufii. So perfectly was this corn preserved that many ears were gathered on which the kernels were easily distinguished, and bushels of charred fragments were taken out. This goes to show that the place was not

* Fragments of pottery are very common on the mounds of A-wa'-to-bi, which is perhaps accounted for by the distance from inhabited pueblos.

rified in the general conflagration. A food-bowl and a very much corroded iron implement were taken from this room. The finding of an iron implement is interesting as showing that at the time of the destruction metallic implements were known to the A-wa'-to-bi people, having no doubt been brought there by the Spaniards. The weapons which were found in abundance were the stone hatchets and arrow-heads so common in the southwest, the latter occurring in surface finds on the ruins. The position in which the corroded knife-blade was found among the corn, leaves no doubt but that it was there at the time of the destruction of the pueblo. The presence of a conglomerate of cinders and small stones in the burnt chambers would seem to indicate the fierceness of the heat during the conflagration. Large quantities of this substance were taken from the chambers in the high range of rooms to the north of the plaza in the western part of the town.

Room (p. h.) with paint and hair strings.—In one of the small rooms which I opened there were several fragments of red pigment, and in a niche in the wall I found a string made of human hair similar to those now used by the Hopi maidens in tying their hair in the peculiar whorls worn by them until they marry. The Indians at work for me were confident that this was the purpose for which the cord was made.

Po-wa-ko kib-va.—As the fact that the men were in the kib-va at the time of the destruction and that many were killed there is repeatedly mentioned in the legend, I was anxious to identify this room. In this search I had very meager data to direct me, the only mention of the kib-va being a very general one by Mindeleff, which gave no account of its position. An isolated ground-plan of a subterranean chamber was noticed in the middle of the plaza to the north of the Mission. Various things led me to suspect that this was a kib-va, but I have only circumstantial evidence to prove such identification. The Indians employed in the excavation called this room a kib-va. This chamber was examined from surface to floor, laying bare the wall and floor on the south side, my trench extending, several feet in width, from corner to corner. From the middle of this trench, extending to the center of the kib-va, I caused another trench to be dug down to the floor, which, as far as my exploration went, was covered with flat stones.

The first trench showed that the south side is fourteen feet from one wall to another; the east side is twenty-eight feet six inches,

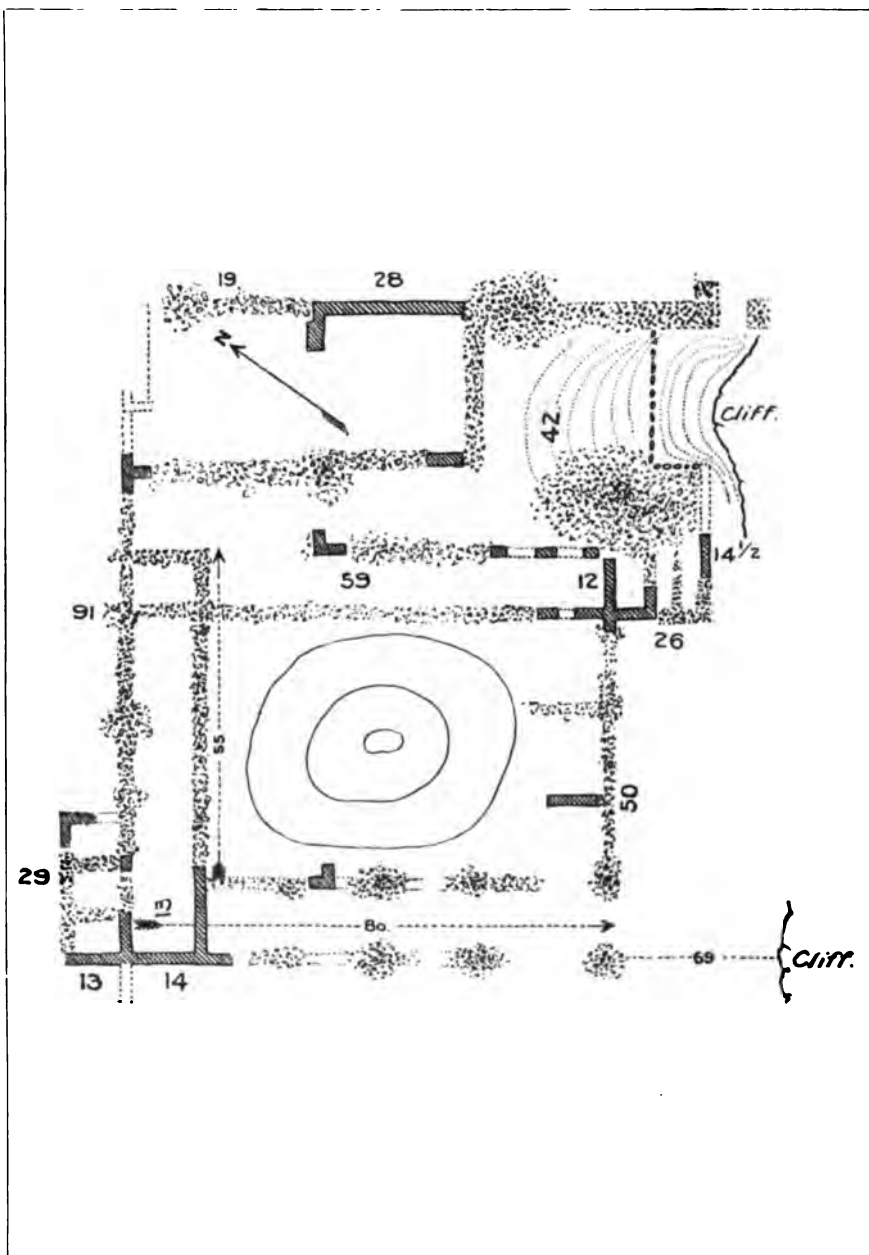


PLATE II.—Ground plan of A-wa'-to-bi.

the west twenty-four feet six inches, and the north side, which is irregular and oblique, eighteen feet. The orientation is N. 40° W.* The floor averages five feet below the surface of the ground.

In these excavations charred wood, ashes, and other evidences of fire were found. The most important discoveries made in this room were a human skull and other bones, which were found four feet six inches below the surface in the middle of the chamber, directly under the place where the old sky-hole formerly opened, through which the relentless Hopi may have thrown down the burning fagots and chile upon their helpless victims. After the Indians had found these bones, which *en passant* it must be said they would not touch with their hands, one of their number, whose father-in-law is In'-ti-wa, the ka-tci'-na moñ'-wi, returned to Walpi that night. The next day a curious custom was carried out, by the advice of In'-ti-wa. Several na-kwa'-ko-ci, strings with feathers attached, were deposited in the trenches as propitiatory offerings to Ma'-sau-wuh, the Death God of whom I have elsewhere spoken. Observing the anxiety of the Hopi workmen, I abandoned excavations in the po-wa'-ko kib-va from policy, for I did not wish the report to be circulated among their people that I desired to find the skeletons of the wizards, as it might prejudice them against me. The number of bones of human beings thus far taken from this excavation is too small to answer the requirements of the legend, but the mass of earth still filling this chamber is great enough to cover many more. New excavations alone can shed light on this question.

I believe that I have excavated the po-wa'-ko or sorcerer's kib-va, and tradition supports this identification. Still I have not proven that to be the case, although the discovery of human bones supports the legend. It seems pretty true that a tragedy took place in this kib-va, for there is no evidence that the bodies were buried there, but whether this chamber is the original po-wa'-ko kib-va or not will always be in doubt.†

The Mission.—The walls standing above ground belong to the Mission and mark the most recent portion of the pueblo. In addition to the standing walls, there are others which undoubtedly belong to the period of the Spanish occupation, and still others of adobe

* For the orientation of the Walpi estufas see my article on Tusayan ceremonials, *Jour. of Amer. Eth. and Arch.*, vol. ii, No. 1. It is interesting to find that the orientation of this chamber corresponds so closely with that of the kib-va of Walpi.

† The Indian workmen called this chamber a sorcerer's kib-va, and its relative position adds weight to the acceptance of the above identification, but I am not sure that the Indians regarded it as an estufa before my excavations.

which may have been added after the destruction of A-wa'-to-bi. The accompanying chart of the ground plan (Pl. II) gives all the data necessary to know the size and altitude of the standing walls. No attempt was made to excavate within the inclosure of the Mission. Mindeleff, in his description of A-wa'-to-bi, gives a fair account of the Mission, and my map of the ground plan supplements his measurements. The differences in our plans may be due to changes since he made his survey—falling of walls, drifting of sand, and other causes.

Old shrines near A-wa'-to-bi.—Of the several shrines in the vicinity of A-wa'-to-bi there is one near the outline ruin to the west of the main pueblo, not far from the sand-hill burial place. This shrine faces to the east and is a rude pile of stones, in which is a piece of petrified wood and two water-worn boulders, called the "Old Chiefs." It is not peculiar in any respect and no offerings were found near it. A figure of this shrine is given in plate III, figure 1. At the extreme west end of the A-wa'-to-bi mesa is a simple shrine composed of eight boulders, with a reddish-colored stone, "Chief," within it. This shrine is figured in plate III, figure 2. A shrine which has evidences of recent as well as ancient use lies under a huge boulder at the base of the extreme west end of the mesa, among the foot-hills. This shrine is more complicated than those mentioned above, and the stones which compose it are nicely joined together. The crescent of this shrine opens toward the south. It has been used in recent times by the Mi-coñ'-iñ-o-vi people, but many of the bung-shaped, squash and melon, ba'-ho(s) which cover the ground bear evidence of considerable age (Pl. III, figure 3).

The entrance to the shrine of the A-lo'-sa-ka faces south, and is situated about fifty feet below the old ruin at the most precipitous point of the mesa. It is a shallow chamber eroded in the side of a large boulder, in front of the entrance to which stands a roughly laid stone wall only a few feet high (Pl. III, figure 4). A flat stone formerly closed it, and sticks of wood, now irregularly placed, show that it was once more of a structure. The floor was covered with soil and there were offerings of ba'-ho(s) in the shrine when I visited it. This is the shrine out of which the A-lo'-sa-ka were taken, but they were afterward returned to the Mi-coñ'-iñ-o-vi people, as I have elsewhere mentioned.* Rough sketches of the A-lo'-sa-ka were

* *Jour. of Amer. Eth. and Arch.*, vol. ii, No. 1.

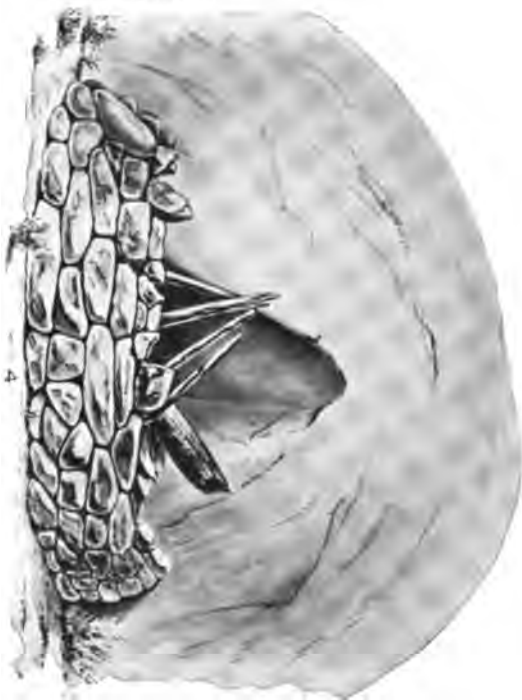


PLATE III.—Old shrines near A-wa'-to-hi.

made when they were taken from the shrine, but the images themselves have not been seen since they were restored to the Indians.

Cemetery of A-wa'-to-bi.—The sand-dunes somewhat back from the mesa and to the west of the ruin of A-wa'-to-bi served as an aboriginal burial place in former times, and from it has been taken some of the best pottery found in Tusayan. These sand-hills are sparsely covered with stunted bushes, and their contour is continually changing on account of the drifting sand. Every sand-storm alters the surface, bringing into view the skeletons of the dead and fragments of food-vessels, some of which are covered with most interesting symbolic decorations. It was not always the habit of the A-wa'-to-bi people to "kill" these food-vessels on the interment of the dead, as many unbroken bowls have been found there. The dead were buried in a sitting posture, the knees drawn up to the breast.*

EXPLANATION OF PLATES.

PLATE I.—Map of ruin of A-wa'-to-bi. This map was plotted by Mr. A. M. Stephen during our visit to the ruin. The heavy black line indicates the edge of the mesa; the lighter lines the contours.

- a.* Highest point of the western portion of the ruin.
- b. s.* Site of the room in which the bear's skeleton was found.
- c.* Rooms with stacks of burnt corn.
- e.* Northeastern corner of ridge of rooms of the eastern division.
- h.* Site of northwestern corner of main ruin.
- n. s.* Narrow room.
- p.* Po-wa'-ko kib-va.
- p. h.* Room with fragments of pigment and niche with hair strings.
- w. s.* Room with southern window.

The figures indicate the size of rooms excavated. Ground plans of buried chambers are to be found in all the higher mounds, but the more important are indicated by special lettering.

PLATE II.—Ground plan of the standing walls of the Mission, with measurements and altitudes.

PLATE III.—Old shrines near A-wa'-to-bi.

- 1. Shrine near the burial sand-hills.
- 2. Shrine at the extreme west end of the mesa.
- 3. Shrine with offerings, situated among the foot-hills at the extreme west end of mesa.
- 4. Shrine of the A-lo'-sa-ka.

*The Walpi people now bury their dead in the foot-hills to the south of the mesa. Food-vessels, with food, a planting-stick, and a twig, with feathers, are placed above the grave.

JAPANESE MINOR RELIGIOUS PRACTICES.—Of miscellaneous minor religious practices, the name is legion. Such are the sprig of holly stuck to a door-post to keep out evil spirits, the imprint of a hand over the door or entrance to a house, and similarly the rude picture of a horse pasted up over the house doors to avert smallpox. What may be the *rationale* of this I know not, but Mr. Aston, in a private communication, suggests that the horse may be intended to hint to the evil spirit that the family is abroad. Another curious practice is that of depositing on some mountain-top the instrument with which a crime has been committed. Till within a few years ago Nantai-zan, a high summit in the Nikkō district, now that happy hunting ground of "globe-trotters," was littered with swords that had thus been offered to the mountain god. Or, leaving the land for the sea, how touching is the sailor's habit of scattering grains of rice on the waves as an offering to Kompira or some other deity with power to still the billows.—*B. H. Chamberlain in Jour. Anthropol. Inst., vol. xxii, London, 1893, p. 358.*

HOW INDIAN SONGS ARE BORROWED.—Indian songs, I have discovered, travel far, and those of one tribe are soon at home in another. There seems to have been quite an extended acquaintance between tribes, the Rocky mountains proving no serious barrier. Customs and songs borrowed from the Crow Indians have obtained for a century at least among the Nez Percé. Dakota songs are also found there with an equally remote introduction. The Omahas took from the Sioux the Ma-wa-da-ne songs, and from the Otoe the Hae-ka-ne. The Dakotas appropriated the Omaha Hae-thu-ska songs, as did the Winnebagos. I have had Omahas sing me the songs of many different tribes, but they were always credited to the tribe to which they belonged. I have never met an instance of plagiarism among the Indians. Certain kinds of songs can be purchased by individuals, and the song becomes personal property, but the purchaser would never claim to have composed it.—*Alice C. Fletcher, "Omaha Indian Music," in Peabody Museum Papers, vol. i, 1893, No. 5.*

PIÑON GATHERING AMONG THE PANAMINT
INDIANS.

BY B. H. DUTCHER.*

While on a trip into Death valley, Inyo county, California, in the latter part of the summer of 1891, I had the good fortune to spend two nights and one day in a camp of Panamint Indians, who were engaged in obtaining their annual supply of "piñons."

In company with John Hughes, the Indian mail-carrier, to the Death Valley signal station, another ^{man} ~~back~~ and a young ^{wife} ~~squaw~~, I left Keeler, on Owens lake, September 18, and started eastward across the summits of the Inyo range toward Cottonwood cañon, in the Panamint mountains. Our first day's journey carried us to the eastern extremity of a high mountain ridge, extending east and west from the Inyo to the Panamint mountains, and separating Saline valley on the north from Panamint valley on the south. The crest or plateau top of this ridge was more or less rocky and broken and covered at its eastern end by a large grove of piñon trees (*Pinus monophylla*), among which the camp was situated.

As this camp was but temporary and established only for shelter while the nutting was in progress, a brief description of it may not be out of place. In the shadow of a small group of piñon trees a number of small circles or "corrals" had been built. Perhaps there were some five or six of these in all, each seeming to accommodate one family or that fraction of a family that was present in the camp. In diameter they measured eight or ten feet, and their walls consisted merely of the broken piñon branches and of the small bushes that grew around, piled up into a loose row two or three feet thick and about as many high. The circle was broken or imperfect where entrance or exit was needed, and where two of these circles became tangent a passage was generally made from one to the other. Their uses seemed to be few—to secure a little privacy for the occupants; to serve as a slight wind-break during the night, when the family slept inside, and during the day to serve as a rack in holding out of the dirt the blankets, extra clothes, cooking uten-

* Of the Death Valley Expedition of 1891.

sils, and other paraphernalia of the household. In the center of each circle was a small area where the fire was kindled, around which all gathered for a short time during the chill of the early morning and in the evening before retiring. The floor was smooth, clear of stones and weeds, and carpeted by a thick layer of fine, gray dust.

The food supply, with the exception of the nuts, was scanty, consisting of a little tea, and sugar, flour, salt, and the refuse from the Keeler slaughter-pen. A can of corn had been purchased, and was opened, as a great luxury.

Their clothing, with the exception of hats and moccasins, was of civilized manufacture, consisting exclusively of sacks and skirts of greasy muslin or calico. One young ^{McN: a ~}squaw was engaged with thread and needle in fashioning one of these garments from some fresh print calico, apparently with some skill. Most of the women wore heavy skin moccasins, in which the soles were sewed to the uppers; the men invariably had shoes. For hats all the older squaws had small conical baskets, under which the hair was piled on top of the head.

Shortly after daylight all hands, one after another, rolled slowly out of their scanty blankets and gathered around the feeble flames that the more energetic had succeeded in starting. Crouching down on their haunches, they endeavored to drive the chill from their bones by presenting first one side to the blaze, then the other, and to remove the sleep from their eyes by vigorous rubbing. Before sunrise a meager breakfast had been eaten, and they began the work of the day, the women betaking themselves to the nutting, the men to further sleep, tobacco, or cards. In fact, with the exception of acting as rather disinterested spectators at times and of eating the pifions on all possible occasions, the men took no part in the industry. My guide at one time during the morning attempted to shoot some of the quail that abounded in the neighborhood, but failed.

Immediately after the meal several of the women equipped themselves with large, conical pack-baskets and beating sticks and sallied forth to gather the cones from the trees in the vicinity. The baskets were made of light wicker-work, shaped like the frustum of a right cone, about two to two and one-half feet high and nearly as broad. The upper base of the frustum, or the bottom of the basket, was flat, and from three to five inches in diameter. A leather thong

was fastened into the side just below the rim, passed around the forehead, and similarly inserted into the wicker-work on the other side of the head, thus serving to bind the basket to the carrier. The beating or pulling sticks were straight rods, about an inch in diameter and five or six feet long, stripped of bark and with all the branches removed, save one at the outer extremity, which was cut off about six inches from its union with the main staff. The stick itself terminated immediately beyond this point. To prevent this spur or limb from being split off by the rough usage to which it was subjected a stout thong was wrapped around from one branch to the other about three or four inches from the vertex of the angle. To give a clearer idea of this instrument, it may be compared to an A, in which the uprights stand for the limbs, one being greatly prolonged, and the cross-bar for the binding thong.

Thus equipped with basket and stick, a ^{WOLF} ~~squaw~~ would advance to some untouched tree and proceed to beat and pick the cones from the limbs until her receptacle was full, when she would return to camp, empty the load onto the ground, and start off again to refill the basket or remain to open cones, as necessity dictated. Those not engaged thus in keeping up the supply of fresh cones busied themselves in removing the nuts.

The cones of *Pinus monophylla* are small, perhaps three inches long by two in diameter, with strong, thick scales, under each of which are found two, rarely one, of the small seeds called "piñons" or pine nuts. Being quite tough when fresh and having moreover an abundant supply of sticky pitch, they are rather difficult to open, unless subjected to a drying treatment. To this end a dense pile of brush is prepared, six or eight feet across and two feet high, and caused to burn slowly or rather to smoulder, the density and close packing of the mass preventing any strong or rapid combustion. On top of this heap and through it the fresh cones are mixed and left until the heat has dried the pitch and caused the cone leaves to open out to an angle of perhaps 45° or 50° and expose the nuts beneath. When a sufficient number of the cones had been dried and opened and the mass had cooled the women would seat themselves in a circle around the heap, each with a shallow, shell-shaped basket, a small stick, and two stones, and proceed to work. One of these stones was flat, of the size of a small plate, and was laid on the ground as an anvil; the other, about the size of the fist, was used as a hammer. Having raked out a few of the dried cones with

her stick, she would grasp one in her left hand and, holding it with its base on the anvil and its apex upward, would strike it from one to three sharp blows with the hammer; then, dropping the hammer, she would grasp the cone in both hands, hold it over the basket-saucer, and by a slight twisting motion, moving the hands in opposite directions, accompanied by a shaking up and down, dislodge the already loosened nuts from under the opened leaves.

This operation almost invariably resulted in the removal of all the nuts; but to guard against loss each cone was examined immediately after the shaking, and if any remained they were picked out by the fingers. The empty cones were tossed aside into a heap.

So completely do they remove the kernels by these operations that though I carefully searched many of the discarded cones not a single nut did I find in any of them.

Woman This labor occupied the greater part of the day of my sojourn in the camp, all the ten or a dozen women taking active part, save one young ~~woman~~, who was nursing a week-old child. Toward noon, a party arriving with a supply of watermelons from Cottonwood cañon, in the Panamint mountains, all hands ceased work and proceeded to refresh themselves, after which the labor was again resumed. During the entire day no one seemed to exert herself to any great extent, all keeping steadily employed in rather a leisurely manner.

The nuts thus secured were of course mixed with more or less "chaff" or cone leaves, which had to be removed before the product was used or packed away. To accomplish this, toward evening, when enough had been secured to make the operation pay, a ~~square~~ would spread out on a smooth patch of ground a blanket or piece of cotton cloth, and, placing a number of nuts in a broad, open dish or saucer of wicker-work, would hold it over the cloth and, tossing the nuts up and down, let the wind fan out the lighter leaves and dirt. After being thus cleaned, the kernels were laid aside and eventually packed into gunny-sacks to be stored or marketed.

The quantity of nuts secured from this single day's packing I should roughly judge to be about one or two bushels, though the number of small lots constituting the whole rendered accurate estimate impossible. The nuts seemed to be very plentiful indeed. I saw several filled grain-sacks that had been set aside, and a number of broad wicker dishes were always kept replenished for immediate use.

**POLYSYNTHESIS IN THE LANGUAGES OF THE
AMERICAN INDIANS.**

BY J. N. B. HEWITT.

In the early part of this century Peter S. Duponceau announced his conviction, obtained from a cursory study of the scanty and imperfect linguistic material accessible to him, that the grammatic phenomena of the known tongues of the American Indians are characterized by a common ground plan, or, adopting a phrase of Maupertuis, a "plan of ideas." This plan he called *polysynthetic* or *syntactic*, and defined it as follows:

"A polysynthetic or syntactic construction of language is that in which the greatest number of ideas are comprised in the least number of words. This is done principally in two ways. 1. By a mode of compounding locutions which is not confined to joining two words together, as in Greek, or varying the inflection or termination of a radical word, as in most European languages, but by interweaving together the most significant sounds or syllables of each simple word, so as to form a compound that will awaken in the mind at once all the ideas singly expressed by the words from which they are taken. 2. By an analogous combination [of] the various parts of speech, particularly by means of the verb, so that its various forms and inflections will express not only the principal action, but the greatest possible number of the moral ideas and physical objects connected with it, and will combine itself to the greatest extent with those conceptions which are the subject of other parts of speech, and in other languages require to be expressed by separate and distinct words. Such I take to be the general character of the Indian languages." *

He elsewhere says:

"I am inclined to believe that these forms are peculiar to this part of the world, and that they do not exist in the languages of the old world." †

In an essay, which won, in 1833, the Volney prize of the Institute of France, he says:

"À l'aide d'inflexions, comme dans les langues grecque et latine, de particules, affixes et suffixes, comme dans le copte, l'hébreu et les langues dites sémitiques, de la jonction de particules significatives, comme

*Transactions of the Historical and Literary Committee of the American Philosophical Society, held at Philadelphia, for promoting useful knowledge, vol. i, p. xxx.

† Loc. cit., p. 370.

dans le chinois, et enfin de syllabes et souvent de simples lettres intercalées à l'effet de réveiller une idée de l'expression de laquelle cette lettre fait partie, à quoi il faut ajouter l'ellipse, qui fait sousentendre, les Indiens de l'Amérique sont parvenus à former des langues qui comprennent le plus grand nombre d'idées dans le plus petit nombre de mots possible. Au moyen de ces procédés ils peuvent changer la nature de toutes les parties du discours ; du verbe, faire un adverbe ou un nom ; de l'adjectif ou du substantif, un verbe ; enfin, tous les auteurs qui ont écrit sur ces langues avec connaissance de cause, depuis le nord jusqu'au sud, affirment que, dans ces idiomes sauvages, on peut former des mots à l'infini." *

If a general principle of the kind here described could be established it would be of the utmost importance to the students of comparative grammar. This, however, can be done only by a careful and thorough analysis by the modern methods of linguistics of every language concerned, an analysis which has not yet been made. For such an analysis trustworthy and sufficient data must also be at hand.

The lexic and syntactic material relating to these languages is, in some instances, quite extensive, consisting mostly of short vocabularies, translations of the Holy Scriptures or portions thereof, and more or less pretentious lexicons and grammars ; but, for the purpose of comparative or other study, these are so faulty and misleading and so warped by erroneous theories and misapprehensions that they are of small value and of precarious utility in morphologic study. The learned Father Cuoq, equally well-versed in Iroquoian and Algonquian speech, says :

"Que penser de certaines traductions des Stes. Écritures ? Ceux qui ont tant soit peu étudié les différentes portions de la Bible traduites dans les langues indiennes de l'Amérique par les soins de certaines *Sociétés Bibliques*, en trouvent la traduction—il m'est pénible de le dire—vraiment pitoyable. Ce n'est rien moins qu'une profanation de la parole de Dieu ; et je suis assuré pour ma part que les membres eux-mêmes de ces sociétés seraient les premiers à répudier leurs pauvres publications et à les condamner aux flammes, s'ils connaissaient les incorrections, les inexactitudes, les solécismes, les barbarismes, et les contre-sens dont elles fourmillent." †

Duponceau had no ready means of testing the work of his chief authorities, and so was compelled to accept their unsupported state-

* *Mémoire sur le système grammatical des langues de quelques nations indiennes de l'Amérique du nord.* Paris, 1838, p. 89.

† " Jugement erroné de M. Ernest Renan sur les langues sauvages," p. 105.

ments and deductions. He drew his information of the Iroquoian language from the works of Zeisberger and Pyrlaeus, chiefly those of the former. A careful and unbiased examination of Zeisberger's work shows that the worthy missionary had at best only a superficial and precarious knowledge of that language, for he lacked the very elementary acquaintance with it which would have enabled him invariably to distinguish its words from their derivatives and from its sentences and phrases.

The method of inflections, which is common to European and other tongues, need not detain us; the method of intercalation or interweaving vocal elements claimed to be peculiarly characteristic of the polysynthetic scheme demands some consideration. Had it a substantial basis of fact it would indeed serve to mark off from all others those languages in which it was found to prevail. The use of a process so singular and abnormal in its operation can be established only by the evidence of unequivocal facts. The data adduced as proof that such a method of combining vocal elements is one of the most characteristic traits of all known Indian tongues are of the most questionable character. This process is not a part of Iroquoian grammar, nor has a satisfactory example of it been cited from Algonquian speech, and Rev. J. Owen Dorsey states that it does not find a place in the Siouan grammatic processes; hence it follows that the languages of these three great stocks are not polysynthetic within the meaning of this term as used by Duponceau, because they do not use the so-called "artificial elements" nor the alleged process of "interweaving together" or "intercalation" of vocables, which alone constitute the characteristic traits of the supposed "polysynthetic construction." This raises the presumption that careful study will show that other less-known Indian tongues, which, like the three named above, have been classed as polysynthetic by Duponceau and his disciples, are not founded on that theoretic plan; because wherever the syntactic and morphologic processes have been ascertained from accurate and sufficient data they have been found at variance with the polysynthetic processes, and they likewise differ greatly among themselves in their ground plans. It has, in fact, been found that those Indian languages whose lexic and syntactic phenomena have been thoroughly analyzed have not, as Duponceau maintained, a peculiar construction of language, in which "the greatest number of ideas are comprised in the least number of words," which is the motive or object of his conjectured ground plan or "plan of ideas."

Duponceau further says:

"Les Indiens, surtout ceux qui sont chasseurs et nomades, n'ont pas une tête bien analytique. Ils se sont bientôt embrouillés dans la formation de leurs mots: recevant leurs idées en groupes, ainsi que la nature nous les présente, ils ont voulu les exprimer à la fois avec toutes leurs parties, telles qu'ils les apercevaient.* Ont-ils voulu, par exemple, donner un nom à un certain arbre, ils n'ont pas pensé à le désigner simplement par le fruit, ou par quelque autre apparence unique; mais ils ont dit: *l'arbre portant tel fruit et dont les feuilles ressemblent à telle chose*, et ils ont cherché à exprimer tout cela par un seul mot. Mais comment faire? S'ils joignaient tous ces mots ensemble, ils en auraient un nouveau d'une longueur énorme; et puis, leur nouvelle langue, abondant en consonnes, n'était pas heureusement formée pour une pareille jonction. Alors ils ont pris quelque chose de chaque mot, et par la réunion et l'intercalation des syllables, et même de sons simples tirés de la phrase qu'ils avaient choisie, ou plutôt des mots incohérents qui la présentaient à leur esprit, ils ont formé un nom propre composé de ces différentes parties d'idées; et pour celles qu'ils n'ont pu y faire entrer, l'ellipse est venue à leur secours. * * * Ce qui nous paraît le plus probable, est que les langues, comme le monde, ont commencé par le chaos, et ont acquis de la régularité plus tôt ou plus tard, sous une forme ou une autre, selon le génie des peuples, leurs situations ou leurs besoins. Celles des Indiens de l'Amérique du nord ont retenu beaucoup de ce genre chaotique qui a dû présider à leur formation. Les parties du discours y sont entremêlées d'une manière qui fait croire qu'elles n'ont pas toujours été soumises aux règles qui les gouvernent actuellement et qui, introduites peu à peu, n'ont pu que modifier, sans le détruire, le système de formation des mots qui paraît avoir prevalu dès le commencement.

"Ce système polysynthétique est ce qui caractérise les langues algonquines, ainsi que toutes celles de l'Amérique, et influe nécessairement sur leurs formes grammaticales, qui ne diffèrent que dans les détails."

To this he adds the following foot-note:

"La plus forte preuve qu'on puisse donner du mélange d'idées qui a existé au temps de la formation de ces langues, est le nombre de mots qu'elles ont pour exprimer la même chose, selon les circonstances qui l'accompagnent. Il y a un verbe pour dire 'j'ai envie de manger de la viande,' et un autre pour 'j'ai envie de manger de la soupe ou de la bouillie;' un mot, pour une plaie faite avec un instrument tranchant; un autre, pour une plaie faite avec un instrument contondant; ces langues généralisent rarement."†

In support of these striking statements Duponceau has produced no trustworthy proofs. He has adduced only the most fanciful

*This is in substance the doctrine of holophrasis, to which attention will be given hereafter.

†Mémoire, pp. 118-120.

reasons to support his conviction that the Indian languages still preserve the "chaotic style" which "seems to have prevailed from the beginning." The intermixture of the parts of speech does not follow from the fact that a language can in a word-sentence say, "I desire meat," or "I desire soup," and can distinguish between a "cut" and a "bruise." Such word-sentences are governed by certain fixed laws of position and sequence of stems.

The usual method of obtaining a vocabulary from an unlettered people is largely responsible for the doctrine that Indians rarely generalize. A savage is asked, How do you say "I eat meat," or "I drink soup?" and, if he understands the question, he replies by the appropriate sentences (not words, as many think), meaning, in his own vernacular, "I eat meat," or "I drink soup." He can distinguish between a *cut* and a *bruise*, and shows it by his language, but must it be inferred from this that he cannot generalize, or that he does it but rarely?

The materials of the language of the Iroquois consist of notional words, namely, nouns, verbs, and adjectives; representative words, namely, prefixive and independent pronouns; relational words, adverbs, conjunctions, and suffixive prepositions; and derivative elements, namely, formatives and flexions.

The distinctive nature and characteristic functions of these elements cannot be changed at will by any speaker, for the good and sufficient reason that a language does and can do only what it is in the habit of doing. In the category of notional words, the class of elements called noun-stems may not indifferently assume the functions and the flexions peculiar to either the verb-stems or the adjective-stems, neither can the verb-stems nor the adjective-stems indifferently assume the functions and the flexions peculiar to either of the other two classes of elements in that category; hence Duponceau's sweeping statement concerning the general character of the American Indian languages, that "they can change the nature of all parts of speech; of the verb, make an adverb or a noun; of the adjective or substantive, a verb," is not true of the Iroquoian tongue. The elements of its lexicon have acquired their individual values by virtue of a series of historical changes, and they severally retain these values solely at the behest of conventional usage, being subject at all times to further mutations of form and signification as this usage may decree.

The stems of words and word-sentences are not divided for any

purpose whatever. The compound stems of word-sentences may, by historical changes, become parts of speech—notional terms—denotive of the things described by the word-sentences from which they are derived, and they can be so considered only when the linguistic sense has come to disregard the separate meanings of the elements thus combined. This is *parasynthesis*.* A prolific source of much error concerning the nature of the grammatic processes prevailing in this language is the fact that these word-sentences are mistaken for words, for a word-sentence must, it is repeated, undergo certain historical changes of form and function before it becomes a word—a part of speech. Conventional usage alone is the arbiter in this, as it is in all things linguistic.

To exemplify this the following concise analysis of the stems of a verb and a noun is given. The verb-stem selected is *-hě's-yě*, from the word-sentence *ru-hě's'-yě*, "he hears, understands (by hearing)," and the noun stem is *-hětc-hră-kwě*, from *ut-hětc-hră'-kwě*, "a chair, seat." These two stems have been chosen solely for the reason that their constitutive elements have not yet undergone that degree of effacement which would render them quite irre recognizable to any but an accomplished master of the language.

The full and original form of *ut-hětc-hră'-kwě* was *ut-hětc-hĩ-hră'-kwě*, which was evidently derived from the word-sentence *yě't-hětc-hĩ-hră'-khwă*, "one (some one) uses it to support his buttocks," in which the pronominal element is *yě't-* (which is the reflexive form of *-yă*, "one or she"), meaning "one-his" or "she-her," the reflexive performing a possessive and not a reflexive office; the noun-stem is *-hětc-hĩ*, from *u-hětc'-hě*, "buttocks, fundament," and, lastly, the verb *-hqră-khwă*, "to support with," "to use for supporting," or "to use to support." This verb-stem is from the word-sentence *ra-hqră'-khwă*, "he uses it for supporting (it)" or "he supports it with (it)," in which the "it" enclosed in parenthesis is understood. These two notional stems, *-hětc-hě* (fundament) and *-hqră-khwă* (to support with, use to support), then form the compound stem of the word, *ut-hětc-hqră'-kwě*, "chair, stool;" but both stems themselves may be still further reduced to show the original ideas which combined to form them. The verb-stem chosen is *-hě'-syě*, from the simple sentence *ru-hě'-syě*, "he hears it," or simply, "he hears, understands (by hearing)." The com-

* The formation and derivation of a word from a compound.

ponents of this stem are *-hē's-* and *-yē'*; *-hē's-* is the stem of the archaic *u-hē'-sē*, "the ear," and *-yē'* is the verb "to enter" of the sentence *ra'-yē'*, "he enters." Hence, "to hear" is made up of the ideas "to enter-ear," but before these two notions could be rendered by "hear" usage had to disregard their several and separate meanings. Moreover, the stem *-hqrā-khwā'*, meaning as a morphologic unit, "to support with," "to use for supporting," or "to use to support," is in its more literal meaning itself the result of the forgetting of the etymologic elements of a compound. It is made up of the stems *-hēqr*, from *ra'-hēqr*, "he puts (it) upon," and the auxiliary *-khwā'*, "to do, make," hence, "to use," the object of the auxiliary being always "it" understood, its object being of course indicated by the context.

The pronominal elements prefixed to the stems of words and word-sentences perform one of two offices: first, they may be prefixed to noun-stems for the purpose of indicating gender or possession; and, second, they may name determinatively the things of which it is required that notional stems be made names or predicates.

In Iroquoian speech all the developments of the language expressed by the terms word-sentence, stem-formation, and inflection, are based primarily on the well-known principle of juxtaposition and a more or less intimate fusion of elements, but the living and traditional usage of the language has established the following morphothetic* canons, which determine the nature and the relative position or sequence of elements that may be combined into words, phrases, and word-sentences, namely:

First. The simple or compound stem of a notional word or of a word-sentence may not be employed isolatedly without a prefixed simple or complex personal pronoun or a gender sign or flexion.

Second. Only two notional stems may be combined in the same word-sentence, and they must not be of the same part of speech.

Third. The stem of a verb or adjective may be combined with the stem of a noun, and the stem of the verb or adjective must be placed *after* and never *before* the noun-stem.

Fourth. An adjective-stem may not be combined with a verb-stem, but it may unite with the formative auxiliary *-thā'*, *to cause* or *make*, and with the inchoative *-ç*.

* From morphothesis, the principle or law fixing not only the sequence but also determining the kind and number of elements which may be embodied in a word-sentence, and also the morphology thus established.

Fifth. A qualificative or other word or element may not be interposed between the two combined stems of notional words, nor between the simple or compound notional stem and its simple or complex pronominal prefix, derivative and formative change being effected only by prefixing or suffixing suitable flexions and formatives to the forms fixed by the foregoing canons.

The following formulas, with examples, chiefly from the Mohawk and Onondaga dialects, will show the application of the preceding canons in the building of words and word-sentences:

Simple Words.

(I.) Pronoun + verb-stem.

In the following examples the pronominal element is separated from the stem by a hyphen.

ka'-riks, it bites (it);	ka'-kě ^a , it sees (it);
yo'-riks, it bites it;	yo'-kě ^a , it sees it;
ye'-riks, she bites (it);	ye'-kě ^a , she sees (it);
ra'-riks, he bites (it);	shako'-kě ^a , he sees them;
shako'-ryos, he kills them;	ra'-yă'ks, he breaks, cuts it.

The final "s" in some of the examples is the sign of customary action and not a part of the verb-stem.

(II.) Pronoun + noun-stem.

In these examples the hyphen divides the pronominal element from the notional stem.

o-no ^w 'să', or	o-ko ^w 'să', or
ka-no ^w 'să', a house; house;	ka-ko ^w 'să', a face or mask;
o-ro ^w 'hyă', or	o-roñ'tă', or
ka-ro ^w 'hyă', sky, the sky;	ka-roñ'tă', a tree or log;
o-qsi''tă', a foot, the foot;	o-hne'kă', water; liquid.

(III.) Pronoun + adjective-stem.

In these examples the hyphen separates the pronominal element from the stem.

ka-hoñ'tci, it is black;	ka-no'ro ^w , it is costly, dear;
	scarce; deplorable;
wa-katc'te', it is durable, lasting;	(w)a'-se', it is new; green;
iw'-es, it is long;	(w)a-ka'yof', it is old, ancient;
w-i'yo, it is fine, beautiful;	(y)o-ya'ne', it is good; proper.

Compound Notional Stems.

(IV.) Pronoun + noun-stem + verb-stem.

In the following examples the pronominal, nominal, and verbal elements are separated one from another by hyphens.

ra-roñt'-yá'ks, he cuts, breaks; ra-no's'-ěñti, he is building a
the tree or log; house;
ra-hy-űskwás, he plucks fruit; ye-the'tcr-oñnis, she makes flour;
ka-hěq'na-ně's'kwás, it poaches wá-skwi'-yá'ks, it crosses the
on the field; bridge;
ye-'wáhri'-saks, she seeks meat; ye-no'kwá'tcra-yěñteri, she un-
is looking for meat; derstands medicine.

(V.) Pronoun + noun-stem + adjective-stem.

The hyphen is used in the following examples as it has been in those under preceding formulas, to separate the elements of the compound or word-sentence.

wa-hya'-ksěñ, (it) fruit is bad; wa-hya-hě's'tci, (it) fruit is black;
ka-ně'sa' kwást, (it) house is good; yo-qsá'-hni-ro", its foot is firm;
yu-hěq nā-kwást, its crop (field) yu-qsá'-ksěñ, its foot is bad.
is good;
ka-no's'-iyo, (it) house is large;

The pronoun *it* enclosed by parentheses is a gender sign only or is understood. Being definitive, it may often be rendered by "*the*."

These morphothetic rules establish and govern the morphology or ground-plan of Iroquoian words and word-sentences, and any violation of these rules by a speaker in forming combinations of vocal elements necessarily produces a meaningless assemblage of articulate sounds. For instance, to combine two nouns, two verbs, or two adjectives in the same compound would not constitute the one noun, verb, or adjective a predicate or qualifier of the other member of the combination.

In speaking of what he is pleased to call the original structure of the American Indian tongues and of the numerous novel forms with which he claims they abound, Duponceau says:

"It is impossible to resist the impression which forces itself upon us, that we are among the aboriginal inhabitants of a *New World*. We find

a *new* manner of compounding words from various roots, so as to strike the mind at once with a whole mass of ideas ; a *new* manner of expressing the cases of substantives, by inflecting the verbs which govern them ; a *new* number (the particular plural) applied to the declension of nouns and conjugation of verbs ; a *new* concordance in tense of the conjunction with the verb. We see not only pronouns, as in the Hebrew and some other languages, but adjectives, conjunctions, and adverbs combined with the principal part of speech and producing an immense variety of verbal forms." *

This alleged *new* manner of compounding words, the so-called polysynthetic scheme, has already been shown to be erroneous and unfounded in fact, since the morphologic processes of those Indian languages which have been critically analyzed do not correspond or accord with the theoretical processes distinctive of the scheme, nor do the morphologic processes prevailing in one tongue accord with those common to another in so marked a degree as to warrant the inference that they are based on a common principle or ground-plan differing essentially from fundamental principles common to languages of the old hemisphere. Concerning the *new* manner of expressing the cases of nouns by inflecting the verbs which govern them, it may be said that it is not true of the Iroquoian tongue ; besides, such a process would imply that there exists a provision for what is still undeveloped and non-existent in many of the Indian languages—a nominal case-ending ; the fact being, in most instances, that the noun is in apposition with an objective pronoun forming an integral part of the person-endings of the verb ; by this means the relation of the noun to the action of the verb is indicated. In other instances the position of a noun in a word-sentence determines its "case ;" in others it is determined by the pronoun with which it is in apposition. In regard to a *new* number, the particular plural, it will suffice to say that it is both Asiatic and European, and to that extent not a distinctive trait of the American Indian languages. It is thus evident that this array of new methods and novel means is the product of misapprehension and insufficient investigation. Duponceau's fundamental error lay in the fact that he attempted to classify all known Indian tongues under a hypothetical system based chiefly on a superficial study of Algonquian morphologies, before he had made a thorough investigation of the morphologies of the other Indian tongues involved. His whole

* Transactions, p. xxxviii.

conception of language was erroneous. For instance, speaking of Indian speech, he says :

“L'organisation intérieure du mot est à la discrétion de l'inventeur. S'il a des règles à suivre, ce sont des règles de goût et non de grammaire. Presqu' entièrement, c'est l'oreille qui en décide ; les changemens et transpositions de syllabes et de sons restent à sa disposition, comme les inversions des mots de la langue latine sont à celle de l'homme qui parle ou écrit dans cet idiome.” *

No critical linguistic student could consistently hold such views of language and its processes. This statement, besides, is scarcely in accord with what he had previously remarked in his Report, where he says :

“Nor can this class of languages be divested, even in imagination, of the admirable order, method and regularity, which pervade them ; for it is evident that without these, such complicated forms of language could not subsist, and the confusion which would follow would render them unfit even for the communication of the most simple ideas. A simple language may be, perhaps, unmethodical ; but one which is highly complicated, and in which the parts of speech are to a considerable degree interwoven with each other, I humbly conceive, never can.” †

The former of these assertions, making the interior form of a word the plaything of the caprice of every speaker's whim and fancy, represents his opinion after more than ten years' study of the languages, and the latter after not more than three, showing that the longer he studied, the less clearly did he comprehend them. Many students have adopted the term *polysynthetic* as a designation of the Indian languages, but, apparently, without taking the precaution to learn the exact sense in which Duponceau himself employed it, or to ascertain whether such a scheme of classification was warranted by the grammatic facts of these languages. In explanation of his use of it he says that the Indian languages belong to “the class which I have denominated *polysynthetic* merely for the sake of designation and without meaning to affix any other importance to the name.” †

It thus appears that he employed the term without direct reference to its etymologic meaning and merely as a tag or label for a theoretic scheme of classification, which he believed epitomized the

* Mémoire, p. 145.

† Op. cit., p. xxvii.

‡ Op. cit., p. xxxvi.

fundamental principles of morphology underlying the structures of the American Indian languages. It should be discarded, since its further use only perpetuates his errors.

In an essay, entitled "Polysynthesis and Incorporation as Characteristics of American Languages," Dr. D. G. Brinton attempts to show that F. Müller, L. Adam, and others fail to comprehend what he himself believes to be Duponceau's conception of a "polysynthetic construction of language." He says:

"I believe that for the scientific study of language, and especially of American languages, it will be profitable to restore and clearly to differentiate the distinction between polysynthesis and incorporation, dimly perceived by Duponceau and expressed by him in the words already quoted. With these may be retained the neologism of Lieber, *holophrasis*, and the three defined as follows:

"*Polysynthesis* is a method of word-building, applicable either to nominals or verbals, which not only employs juxtaposition with aphæresis, syncope, apocope, etc., but also words, forms of words and significant phonetic elements which have no separate existence apart from such compounds. This latter peculiarity marks it off altogether from the processes of agglutination and collocation.

"*Incorporation* (*Einverleibung*) is a structural process confined to verbals, by which the nominal or pronominal elements of the proposition are subordinated to the verbal elements, either in form or position; in the former case having no independent existence in the language in the form required by the verb, and in the latter case being included within the specific verbal signs of tense and mood. In a fully incorporative language the verbal exhausts the syntax of the grammar, all other parts of speech remaining in isolation and without structural connection.

"*Holophrasis* does not refer to structural peculiarities of language, but to the psychological impulse which lies at the root of polysynthesis and incorporation. It is the same in both instances—the effort to express the whole proposition in one word. This in turn is instigated by the stronger stimulus which the imagination receives from an idea conveyed in one word rather than in many." * * *

"As the holophrastic method makes no provision for the syntax of the sentence outside of the expression of action (*i. e.*, the verbal and what it embraces), nouns and adjectives are not declined. The 'cases' which appear in many grammars of American languages, are usually indications of space or direction, or of possession, and not case-endings in the sense of Aryan grammar.

"A further consequence of the same method is the absence of true relative pronouns, of copulative conjunctions, and generally of the machinery of dependent clauses."

All this doubtless has a certain plausibility so long as it is tested solely by the faulty and equivocal works of the pioneers in American Indian philology; but, by the light of the facts of language which are gradually being made available, these polysynthetic dogmas are being dissipated.

Dr. Brinton's definition of polysynthesis is clearly defective and incomplete. There is an omission of the name or names of the elements subject to "juxtaposition," and also of the term co-ordinate with "juxtaposition" and expressive of a *process* contrary or co-relative to that of "juxtaposition," two very important omissions in a definition designed to "clearly differentiate the distinction between polysynthesis and incorporation, *dimly* perceived by Duponceau." But, as Dr. Brinton was merely recasting and remoulding the first section of Duponceau's definition of a polysynthetic construction of language, the omitted process, judging from this fact and from other parts of Dr. Brinton's essay, is that affirmed by Duponceau to consist in the "intercalation" or "interweaving together the most significant sounds or syllables of each simple word" and the various "parts of speech, particularly by means of the verb." The alleged process of intercalation or interweaving together of vocal elements has already been shown to be mere hypothesis and unfounded in the known facts of Indian languages. Moreover, Dr. Brinton tells us that agglutination and collocation differ from polysynthesis in not using "words, forms of words and significant phonetic elements which have no separate existence apart from such compounds." If this statement were substantiated by facts, it would pass unchallenged; but it is to be doubted that "agglutination and collocation" do not employ, in the polysynthetic sense, "words, forms of words," which have no existence outside of compound forms. Even in the English, which is agglutinative in some of its forms, such nouns as *sooth* and *wise* are practically obsolete in current speech, although in use in compound forms; hence, must it be inferred that they never had an independent existence in the language? Not at all. In the obsolescence of words and forms they will maintain an existence in certain quaint or striking phrases or compounds when they have lost their adaptability for current and new formations.

It may be stated that "significant phonetic elements" form no part of the linguistic material of Indian languages any more than they do of that of the Indo-European languages. Words and sounds

in Indian as in other languages have no intrinsic signification apart from that imposed on them by the common usage of the community.

The apparent abbreviation of nouns in derivative words and word-sentences which has given rise to some of these misleading designations may be explained by the fact that those who attempted to define the methods of derivation and combination of vocal elements took noun-stems from prepositional and other phrases or from word-sentences wherein those students have perchance found the stem for which they sought, overlooking the fact that language does not make decomposition an antecedent condition to other composition. Again, in some languages the gender-sign is usually discarded from the noun-stem when the stem is united with another to form a new compound.

From Dr. Brinton's definition of incorporation—the process of intercalation or interweaving together of Duponceau—it follows that where no conscious or artificial mutilation of notional stems takes place in the compound there is no subordination, and so to that extent no incorporation; that where no modal or tensal flexions are affixed to the word-sentence in such manner as to give the pronominal and nominal elements—the person-endings and the noun-stems—the appearance of being infixed or enclosed between those elements and the verb stem, there is likewise no incorporation. These changes are not made in the simple tenses of the Iroquoian indicative mode, showing that the combination of the notional stems is a condition antecedent to the affixion of modal and tensal flexions to the word-sentence. The fatal error of this doctrine of incorporation lies in the fact that it places flexions and formatives on an equality with notional stems in the expression of thought, making flexions and formatives an integral part of the semasiologic difference between two expressions or word-sentences composed of unlike notional stems, for it is not the flexions but the notional stems which, from the standpoint of morphology, give to every word-sentence its semasiologic individuality. So that testing the question by Dr. Brinton's definition of what constitutes incorporation as he conceives it was dimly perceived by Duponceau, there is in the ground-forms of Iroquoian words and word-sentences no trace of incorporation; for it is not a question of the affixion or suffixion of elements to a root or stem, but merely the use of a system for that purpose.

The statement that the word-sentence exhausts the syntax of the language in which the principle of incorporation prevails, that "no provisions for the syntax of the sentence outside of the expression of action (*i. e.*, the verbal and what it embraces)" are made, is unwarranted so far as the Iroquoian, Siouan, Athapaskan, and Algonquian languages are concerned. The employment by these languages of correlatives, relative and coördinate pronouns and conjunctions, and prepositional phrases is ample refutation of such claim. Facts like these show on what an unsubstantial basis was erected the hypothetical polysynthetic scheme of Duponceau and his followers.

Dr. Brinton affirms that incorporation consists in subordinating the nominal and pronominal elements of the proposition to the verbal in one of two ways: first, by a mutilation of form, and, second, by position. In the first case the noun or pronoun must assume a form which it does not have apart from such compounds, and in the second it must be placed between the signs of mode and tense on the one hand and the verb-stem on the other. In Sanscrit, an Indo-European language, the person-endings which are admittedly pronominal in origin do not have the form of the pronouns when apart from the compounds to which they are affixed. Moreover, they may be inserted between the verb and its adverbial qualifiers in the proposition.

In section 249 of his Sanscrit Grammar Prof. Max Müller says:

"The comparative is formed by *tara* or *iyas*; the superlative by *tama* or *ishtha*. These terminations, *tara* and *tama*, are not restricted in Sanscrit to adjectives. Substantives, such as *nri*, man, form *nritamah*, a thorough man; *stri*, woman, *strilara*, more of a woman. Even after case-terminations or personal-terminations *tara* and *tama* may be used; thus from *purvahne*, in the forenoon; *purvahnetare*, earlier in the forenoon (Pan., vi, 3, 17); from *pachati*, he cooks; *pachatilaram*, he cooks better (Pan., v, 3, 57); *pachatitamam*, he cooks best (Pan., v, 3, 56)."

Here the pronominal elements, the person-terminations, and even the case-endings are inserted (to use the language of polysynthesis) between the notional stem and its adjectival and adverbial adjuncts. This is within the purview of Dr. Brinton's definition of incorporation, the subordination of the pronominal elements both in form and in position surpassed by nothing from American languages. Is, therefore, the Sanscrit based on a model common to the aboriginal American tongues? If modern instances of this

"incorporation" and the synthetic capacity for compounding words be necessary, let us turn to the abundantly synthetic structure of modern Russian, which exemplifies the important fact that in the Indo-European family, of which the Russian is a member, the tendency has not been "everywhere and in all respects downward, toward poverty of synthetic forms, throughout the historic period." Of the structure of this language Prof. W. D. Whitney says:

"The Russian of the present day possesses in some respects a capacity of synthetic development hardly, if at all, excelled by that of any ancient tongue. For example, it takes the two independent words *bez Boga*, 'without God,' and fuses them into a theme from which it draws a whole list of derivatives. Thus, first, by adding an adjective suffix, it gets the adjective *bezbozhnŭŭ*, 'godless;' a new suffix appended to this makes a noun, *bezbozhnik*, 'a godless person, an atheist;' the noun gives birth to a denominative verb, *bezbozhnichat*, 'to be an atheist;' from this verb, again, come a number of derivatives, giving to the verbal idea the form of adjective, agent, act, and so on: the abstract is *bezbozhnichestvo*, 'the condition of being an atheist;' while, once more, a new verb is made from this abstract, namely *bezbozhnichestvovat*, literally 'to be in the condition of being a godless person.' A more intricate synthetic form than this could not easily be found in Greek, Latin, or Sanscrit; but it is no rare or exceptional case in the language from which we have extracted it; it rather represents, by a striking instance, the general character of Russian word-formation and derivation." *

This, Professor Whitney holds, shows the futility of attempting to maintain that there has been "an uninterrupted and universal reduction of the resources of synthetic expression among the languages of the Indo-European family," demonstrating conclusively that even the members of a linguistic family differ in synthetic capacity.

These examples of the synthetic power in the Sanscrit and Russian languages show that the synthesis of a large number of elements into the form of a word is not a trait peculiar to the Indian languages; Duponceau and his followers maintain not only that this exuberant synthetic capacity prevails in all known Indian tongues, but also that all these synthetic forms are based on one common model distinctively peculiar to these aboriginal languages; but, if Dr. Brinton's definition of what constitutes incorporation be accepted, then the Sanscrit and the Russian may be confidently said

* Language and the Study of Language, p. 281.

to form their words and word-sentences on the theoretic ground-plan conjectured to be the pattern of all the grammatic structures of the American Indian tongues.

Can it, therefore, be asserted that the Sanscrit, the Russian, and their congeners belong to a family of languages based on a model common to that of the American Indians? As there is no ground-plan common to all the well-known Indian tongues, such an assertion cannot well be made. They, like the languages of the old hemisphere, have traits which are found in the majority of languages and they also individually have others which are idiomatic.

Again, Dr. Brinton says :

"As the effort to speak in sentences rather than in words entails a constant variation in these sentence-words, there arises both an enormous increase in verbal forms and a multiplication of expressions for ideas closely allied. This is the cause of the apparently endless conjugations of many such tongues, and also of the exuberance of their vocabularies in words of closely similar signification. * * * Languages structurally at the bottom of the scale have an enormous and useless excess of words. The savage tribes of the plains will call a color by three or four different words, as it appears on different objects. The Eskimo has about twenty words for fishing, depending on the nature of the fish pursued. All this arises from the 'holophrastic' plan of thought."

But Dr. Brinton does not show this by the convincing method of citing unequivocal facts of language. He evidently overlooks the impossibility of speaking in words without the use of sentences. What evidence has he adduced to prove that the structure of any one Indian tongue is the product of an "effort" to speak in some specific manner. The truth of the matter is that the speakers of Indian languages are just as powerless consciously to change the habits of their several idioms as are the speakers of Indo-European and other tongues.

The statement that certain Indian tongues call a color by three or four different names as it appears on different objects is due to erroneous information. The explanation of this difficulty is this: the three or four different names or words are not names of only one color, but rather of as many colors, or, strictly, as many shades of the same color as have received appellations in the language in question. In the English, one says "a gray horse," but "a dun cow;" "a bay horse," but "a red apple;" "a yellow dog," but "a hazel eye," etc.

The other remark, stating that the Eskimo possesses twenty words for fishing, "dependent on the nature of the fish pursued," is to be explained in a similar manner, because it is obvious that the *different means and methods* of fishing necessarily require *different* words for their designation. In like manner the Missionary Butrick, who preceded Jarvis and Pickering, stated that the language of the Cherokees, owing to its incapacity for generalization, has fourteen verbs to denote washing different things, but no verb to denote washing in general. An analyzation of the fourteen examples given shows that they are not all verbs denotive of washing; some signify "to swim," others "to soak," others "to wet or sprinkle," and still others "to boil," which, of course, it would be folly to classify among the verbs meaning to wash or lave. Thus, a rational explanation is supplied for what appeared to be an anomaly in language.

In speaking of the elements used in polysynthesis and incorporation Dr. Brinton says (*op. cit.*):

"As polysynthetic elements we have the inseparable possessive pronouns which in many languages are attached to the names of the parts of the body and to the words for near relatives; also the 'generic formatives,' particles which are prefixed, suffixed, or inserted to indicate to what class or material objects belong; also the 'numeral terminations' affixed to the ordinal numbers to indicate the nature of the objects counted; the negative, diminutive, and amplificative particles which convey certain conceptions of a general character, * * * but are generally not words themselves, having no independent status in the language. They may be single letters or even merely vowel-changes and consonantal substitutions, but they have well-defined significance."

Again (*op. cit.*), he says:

"Although in polysynthesis we speak of prefixes, suffixes, and juxtaposition, we are not to understand these terms as the same as in connection with the Aryan or with the agglutinative languages. In polysynthetic tongues they are not intended to form words, but sentences; not to express an idea, but a proposition. This is a fundamental, logical distinction between the two classes of languages."

In Iroquoian and Algonquian speech the names of the parts of the body are not inseparably connected with "possessive pronouns," nor do they employ "numeral terminations" to indicate the "nature of the objects counted." Dr. Brinton endeavors to make a distinction between "prefixes, suffixes, and juxtaposition," when used in reference to Aryan and agglutinative languages and when they refer to flexions in Indian languages, on the erroneous

ground that in polysynthetic tongues their function is "not to form words, but sentences; not to express an idea, but a proposition." A more misleading statement or a more lamentable confusion of terms regarding the function and use of flexions in language it would be difficult to equal. There is nothing in the use and historical development of flexional and formative elements in those Indian languages which have been thoroughly studied by the scientific methods of modern linguistics to warrant the assumption that formatives and flexions are employed solely for the purpose of forming sentences, and that they do not compose essential parts of words. Such a contention can rest solely on the tremendous assumption that every Indian necessarily knows the etymology—the component parts or constitutive elements—of each word he employs. The science of language stands opposed to such fanciful assumptions. Moreover, this is another proof, if such be needed, that the doctrine of polysynthesis rests on a fundamental misconception of the phenomena of linguistic growth and development, for its methods and means of linguistic growth do not conform to those established by the science of language. In a science so well constituted as is that of comparative linguistics, groundless assumptions should be avoided. In a science of this character, research to be fruitful of substantial and trustworthy results must converge toward a self-sustaining and continuous development. The findings of to-day must enlarge without overturning the conceptions of yesterday, and thenceforward there must be "system, but no systems;" facts and reasons must take the place of authorities. But, in the fruitful field of American Indian linguistics, there appears to be no common method or system of study, and for this reason every important question pertaining to these tongues is in dispute, with no recognized criterion by which the accuracy and trustworthiness of any result, system, or conclusion may be tested. This is the soil in which controversy flourishes. It is too much the custom to quote authors rather than to give facts, although the authors quoted may or may not have known a reason for what they wrote.

After citing from Lacombe's Cree Grammar an analysis of a nominal compound-stem, Dr. Brinton remarks, in referring to the constitutive elements thus found:

"Not a single one of the above elements can be employed as an independent word. They are all only the raw material to weave into and make up words."

And, from Father Montoya's *Tesoro de la Lengua Guarani*, he adopts the following remarkable statement :

"The foundation of this language consists of particles, which frequently have no meaning if taken alone ; but when compounded with the whole or parts of others (for they cut them up a great deal in composition) they form significant expressions ; for this reason there are no independent verbs in the language, as they are built up of these particles with nouns and pronouns."

Then Dr. Brinton says :

"This analysis, which Montoya carries much further, reminds us forcibly of the extraordinarily acute analysis of the Cree (Algonkin) by Mr. James Howse. Undoubtedly the two tongues have been built up from significant particles (not words) in the same manner." *

This species of "extraordinarily acute analysis" amounts virtually to this, that it finds in certain languages "significant expressions," formed by compounding together certain meaningless particles with fragments of other equally meaningless particles, and this, it is claimed, is the method of word-forming pervading the Indian languages. This is romance and not comparative grammar. Words can be modified by other words only. Relations of ideas must necessarily be indicated by words which, by the tropic action of metaphor, will eventually be formatives and flexions.

Abandoning his first but truer impressions of these Indian tongues, expressed ten or twelve years earlier in his report, Duponceau, in his *Mémoire*, adopts the fallacious doctrine since called holophrasis. Here (p. 249) he says :

"The grammatic forms of these languages are in perfect harmony with the method in which they form their words ; the same system rules everywhere ; and everywhere one sees the absence of the spirit of analysis. *We had believed at one time that analysis should precede synthesis ; but more profound researches and deeper reflections* have convinced us that the sythetic forms that characterize these idioms result from the inability of those who formed them to analyze the concrete ideas which presented themselves to their imagination, and they have sought to express them *en masse*, as they have perceived them."

This, in short, is the foundation of Dr. Lieber's doctrine of holophrasis and adopted by Dr. Brinton. It is due wholly to a confounding of the analytic mode of expression with mental analysis.

* P. 82.

In arguing from a theoretic standpoint against the doctrine of a primitive oligo- or monosyllabic stage of development in the Indo-European family of languages, the late M. Renan follows the same line of argument that Dr. Lieber adopted in support of holophrasis. M. Renan says (Origin of Language, seventh chapter) :

"Another characteristic which the progress of comparative philology authorizes us to attribute to primitive language, as in general to creations of the primitive human mind, is the synthesis and exuberance of its forms. It is too often imagined that simplicity, which, relative to our analytic processes is anterior to complexity, is also anterior in the order of time. This is a vestige of the old usages of the scholastics and of the artificial method which logicians employ in psychology. * * * Far from this beginning by analysis, the first act which it (the mind) proposes is, on the contrary, complex, obscure, synthetic; all is heaped together and indistinct. * * * The idea is expressed at first with its entire *cortège* of determinatives and in a perfect unity. * * *

"The history of different systems of conjugation gives place for analogous considerations. In our modern languages the subject, the verb, and the several relations of time, mode, and voice, are expressed by isolated and independent words. In ancient languages, on the contrary, these ideas are most often comprised in one single word; *amabor* contains the idea of *to love*, the indication of the first person, that of the future, and that of the passive. * * *

"Agglutination must have been the dominant process of the language of primitive men, as synthesis, or rather syncretism, was the characteristic of their thought."

The criticism of these views by the distinguished linguist, Prof. W. D. Whitney, is cogent and effective; and since the argument of Professor Whitney embodies the writer's views on the subject of holophrasis as defined by Dr. Lieber, it will be given here entire. Professor Whitney says :

"The synthetic forms which we are asked to regard as original have not the character of something indistinctly heaped together; they contain the clear and express designation of the radical idea and of its important relations; they represent by a linguistic synthesis the results of a mental analysis. The idea is, indeed, *conceived* in unity, involving all its aspects and relations; but these cannot be separately *expressed* until the mind has separated them, until practice in the use of language has enabled it to distinguish them, and to mark each by an appropriate sign. In *amabor*, the (Latin) word cited as an example of synthesis, are contained precisely the same designations as in the equivalent English analytic phrase, "I shall be loved;" *ama* expresses "loving;" *bo* unites future-sign and ending designating the first person; and the *r* is

the sign of passivity. Who can possibly maintain that a system of such forms, gathered about a root, exhibits the results of experience, of developed acuteness, in thought and speech, any less clearly than the analytic forms of our English conjugation? The two are only different methods of expressing the same 'array of determinatives.' The first synthetic mental act, on the contrary, is truly represented by the bare root: There all is, indeed, confused and indiscrete. . . . M. Renan, in short, has made a very strange confusion of analytic style of expression with mental analysis: All expression of relations, whether by means that we call synthetic or analytic, is the result and evidence of analysis." *

This reasoning thoroughly dissipates the position taken by Dr. Lieber in support of the doctrine of holophrasis. Although written in view of the languages of the Indo-European family, it applies with equal force to the languages of the American aborigines, the word-sentences of which are the same in kind with those of the former.

The comparison of linguistic forms to ascertain probable linguistic affinity can be used with extreme caution and to a limited extent only. The information and data for such a study must be accurate and trustworthy in an unexceptional degree; even then its results must, in a measure, be necessarily of doubtful value, since the scientific method of the science of language demands that no human nature different from the one we know be made a factor in the problem, and the human organism, under like conditions, acts with more or less uniformity.

Linguistic classification by means of morphologies—grammatical and syntactic accordances alone, like that by the genetic method—the historically traceable identity of elements—is, of course, incompetent and of no force to affirm or to deny identity or possible correspondences among the ultimate elements of some or all linguistic groups—accordances antedating all, even partial, grammatical development, because its right to be rests on the development of the parts of speech and their flexions—the derivative and the syntactic processes; beyond these, the tokens of the grammatical period, it cannot take us. This is of course true, because in every language the earliest records of men can carry us back only to a point far distant from the genesis of its peculiar structure and still more distant from the beginnings of human speech.

* *Op. cit.*, pp. 285, 286.

The foregoing paper was read before the Anthropological Society of Washington. In the discussion which ensued the following remarks were made by Rev. J. Owen Dorsey:

Several weeks ago Mr. Hewitt requested me to examine the assertions of Duponceau and others which have been criticised to-night, in order to ascertain whether those statements agreed with what I had found in the languages of the Siouan and Athapascan families. In consequence of this examination I have been forced to the conclusion that the assertions of Duponceau and others respecting the structure of Indian languages should be modified, so far as the Siouan and Athapascan languages are concerned. A few examples, out of many that I can furnish, must suffice at present, but I think that they will show the justice of my conclusion.

On page 117 of Duponceau's *Mémoire* it is said:

"Chacun fait un mot à sa manière, qu'il accompagne de signes, et qu'on entend en partie par intuition."

I have yet to find an Indian tribe to which this applies. It is not true that among the Siouan tribes, for instance, spoken language is invariably accompanied by gestures, though signs are made now and then, just as they are made by Frenchmen or Italians in their conversation. Many a time has an Indian crier gone around the village on a dark night, when no gestures could be seen, and yet his words have been understood by the people. No Siouan Indian could "make a word in his own way;" he had to conform to fixed laws, else his speech could not be understood.

On page 118 the same writer observes:

"Ont ils voulu, par exemple, donner un nom à un certain arbre, ils n'ont pas pensé à le désigner simplement par le fruit, ou par quelque autre apparence unique; mais ils ont dit; *l'arbre portant tel fruit et dont les feuilles ressemblent à telle chose.*"

No Siouan Indian speaks thus of any of the flora of his land. Of specific tree names in the Biloxi language I have recorded over two dozen, and only in three does the word for tree appear as part of the name, and in each of these three the compound ends with *udi*, trunk or stock. This last word has its equivalent in the tree names of the other Siouan languages. In Dakota, choke-cherries are *chanpa*, and choke-cherry bushes *chanpa-hu*. A plum tree is *kanta-hu* in Dakota (from *kanta*, plum, and *hu*, trunk or stock), and *kande-hi* (from *kande*, plum, and *hi*, trunk or stock), in Dhegiha

Many other tree names could be given, in most of which the name is formed by the simple juxtaposition of the elements. The alleged expression of case by the inflection of verbs governing nouns does not exist in Siouan languages, unless it applies to the instrumental form of the verb (as *man iui*, he was wounded with or by an arrow: *man*, arrow; *i-*, instrumental prefix to the verb; *u*, to wound), which sometimes has a locative force, as in *dhie dhan iui*, he was wounded *in* the side. On the contrary, in the Biloxi, the nominative and objective signs are suffixed to nouns and pronouns, instead of being attached to the governing verb. There are no instances of the "particular plural" in the languages which I have recorded, although the dual often appears in the verb and some other parts of speech. In Dakota, Dhegiha, etc., there is a first person dual in the verb; in the Tutu and cognate Athapaskan languages of Oregon, the verb has a dual in all three persons, and so has the pronoun. Duponceau speaks of "a new concordance of tense of the conjunction with the verb." This does not appear in Siouan languages.

A single Cree compound is given as an example of polysynthesis in nouns, and this word is declared by so high an authority as Dr. D. G. Brinton to be a *fair* example. We should not be content with a single example, especially when that word (the name for cross) seems to be a modern word, introduced after the arrival of the missionaries. Just here let me quote Dr. Brinton. On page 21 of his article on Polysynthesis and Incorporation he says:

"While the genius of American languages is such that they permit and many of them favor the formation of long compounds which express the whole of the sentence in one word, this is by no means necessary. Most of the examples of words of ten, twenty or more syllables are not genuine native words, but novelties manufactured by the missionaries."

I know by experience how difficult it is for a missionary to convey to the minds of his hearers certain religious ideas. Again and again did I try when missionary to the Ponka Indians to find the proper Indian word for *kingdom*, in order to make even an approximate translation of the petition, "Thy kingdom come." The Cree word for cross (if it be, as I suspect, a modern word) is as poor an illustration of what the author contemplated as is the Mexican name for *goat* given by Dr. Whitney on page 348 of his work entitled "Language and the Study of Language," as there is no species of goat indigenous to the Western hemisphere. Any one who has lived among Indians knows the worthlessness of adducing modern

names (*i. e.*, names of objects introduced among the Indians since the arrival of the white race on this continent) for the purpose of illustrating the structure of an Indian language. As far as I can judge from such illustrations of polysynthesis in nouns, no such process occurs in the Siouan languages, nor can I recall any instance of it in the Athapascan languages of Oregon.

Dr. Brinton refers to "generic formatives," by which, I suppose, he means classifiers. These classifiers are found in the Athapascan and Siouan languages, and they perform several functions: sometimes they indicate to what classes objects belong (the sitting, standing, reclining, etc., of the Athapascan and Siouan; the earthy, mushy, watery, stony, etc., of other languages); sometimes they distinguish between the subject and the object of an action, etc. Numeral terminations, indicating the nature of the objects counted, are unknown in the Siouan languages; but in the Athapascan languages of Oregon there are two series of numerals, the human and the non-human.

We are told that polysynthesis is a characteristic which distinguishes American Indian languages from those of the old world. Is there nothing of the nature of so-called polysynthesis in the Aryan languages? In Greek, *δαισιδαίμων* is explained by *ὁ τοὺς δαίμονας δαΐσας*; *ἐπιχαιρέκακος* by *ὁ τοῖς κακοῖς ἐπιχαίρων*; *κακοδαίμων* by *ὁ κακὸν δαίμονα ἔχων*; *ἐνθεος* by *ὁ τὸν θεὸν ἐν ἑαυτῷ ἔχων* (Kühner, Greek Gr., New York, 1864, p. 296). The Sanscrit was especially distinguished by its power of forming compounds of any length, and one of the greatest difficulties of the language lies in the finding out the exact relation of the different parts. Thus, a Hindu could speak of a man as being "tiger-king-hand-sword-killed" (a very moderate compound). This would mean "killed by a sword in the hand of a king who was like a tiger."*

On pages 16 and 17 of the article on polysynthesis and incorporation Dr. Brinton says:

"As the holophrastic method makes no provisions for the syntax of the sentence outside the expression of action (*i. e.*, the verbal and what it embraces), nouns and adjectives are not declined. The 'cases' which appear in many grammars of American languages are usually indications of space or direction or of possession and not case-endings in the sense of Aryan grammar."

* Peile, *Philology*, N. Y., 1877, pp. 77, 78.

What are case-endings in the sense of Aryan grammar? Kühner informs us that "all the relations which the Greek denotes by the genitive, dative, and accusative were originally considered relations of *space*."* The relations of time and causality also were regarded as relations of *space*. Whitney remarks that out of the seven cases "three of them distinctly indicated local relations: the ablative denoted the relation expressed by *from*; the locative that expressed by *in*; the instrumental that expressed by *with* or *by*."† To these Peile adds the dative, denoting the relation expressed by *to* or *towards*.‡ Can any one explain away these words of Kühner, Whitney, and Peile?

The learned author of "Polysynthesis and Incorporation" informs us that "a further consequence of the same method" (*i. e.*, his method of polysynthesis) "is the absence of true relative pronouns, of copulative conjunctions, and generally of the machinery of dependent clauses." In Siouan languages there are copulative conjunctions. That there are words which perform the functions of relative pronouns may be seen from the following sentences:

Mazhan dhan ankikandhai te andhia tangatan ebdhegan—I
Land the we desire for the we fail we shall I think
 ourselves (which)

think that we shall fail to obtain the land which we desire for ourselves.

Nuzhinga dhii dhinke e azhi ha. Panka azhi
Boy gave it he who that one another : Ponka another
 to you (aforesaid)
shange tan ihan tan adhin aka e gdhizai
horse the his the has he who that one took
 standing mother standing (subject) (aforesaid) his own
shangetazhinga—The youth who gave it to you is not the one (who
 colt

now has the stray colt). He who has taken it is the Ponka who has the colt's mother.

Unless one has before him one or more series of sentences, such as occur in myths or epistles, he is hardly in the position to speak with authority, at least so far as dependent clauses are concerned.§

* Op. cit., p. 373.

† Op. cit., pp. 271, 272.

‡ Op. cit., pp. 102-106.

§ For examples of dependent clauses in the Siouan languages see my Madison address, "The Biloxi Indians of Louisiana," p. 16, and "Contributions to North American Ethnology," vol. 6, pp. 582, 585, *et passim*.

On page 16 Dr. Brinton says that "the subject is usually a pronoun inseparably connected or, at least, included within the tense sign," and in the same paragraph he speaks of the tense sign preceding the subject. This cannot apply to Siouan languages. In those languages the tense sign, when any is used, follows the subject, and is usually near the end of the clause or sentence.

An-wan-khpa-ni, "I am poor," in Dhegiha cannot be "My being poor," as the pronominal fragment is *anwan*, which is objective, as shown by the vowel *a*, whereas the possessive and dative of the first person would have the vowel *i*.

MENOMONI CULT SOCIETY.—The last annual meeting of the Menomoni cult society, usually designated as the Grand Medicine Society, shows conclusively that its days are numbered. The Government has been endeavoring to dissuade this tribe, as well as the Ojibwa and others of the Algonquian linguistic stock, from holding such meetings and to adopt some creed of Christian faith. Neither the Government nor the church has shown much power in this direction, but the society will become extinct of its own accord, as the old men, the fanatical pagans, are rapidly dying off, while the young men take but little interest in the ceremonies, looking upon them as farcical and of no special consequence.

The Menomoni society initiate a new member whenever death removes one from its fold. The initiates, both this year and last, were little girls, the last one to enter being only four years of age and not sufficiently vigorous to bear the strain of an ordeal of twenty-four hours. Women and girls are now, no doubt, in excess, the male membership consisting of the eldest and most decrepid men of the tribe.

W. J. HOFFMAN.

THE PENNSYLVANIA-GERMAN SOCIETY will hold its annual meeting at York, Penna., about October 14. The society is in a very flourishing condition, has a large membership, and was organized several years ago for the purpose of collecting and preserving all facts relating to the early settlement of the State, the former customs and folk-lore of the people, etc. The society publishes an annual report of operations.

"LA MENSURATION DU COU."—In Tome VI, No. 10, 1893, of *Mélusine*, there is an interesting article, the joint production of MM. Gaidoz and Perdrizet, on the size of the neck as an index of nubility and virginity in both male and female persons in the popular beliefs current among various folk. Citations are given from various authors, among others, C. Valerius Catullus, Vossius, Scaliger, Ellis, describing the custom of measuring the neck. The question was discussed in 1888 by the "Société d'Anthropologie de Paris," and the discussion was published in the *Bulletin de la Société d'Anthropologie de Paris*, 4th series, Tome XI (1888), pp. 459 et 472. The following quotation from the article will show its nature: "Aiez une éguillée de fil blanc, mesurez avec ce fil la grosseur du cou de la fille, puis vous doublerez cette mesure, et vous en ferez tenir les deux bouts à la fille avec ses dents, et vous étendrez ladite mesure pour faire passer sa tête; si la tête passe trop aisément, elle est corrompue; si elle ne passe qu'à peine, assurez-vous qu'elle est pucelle." *Secrets merveilleux de la magie naturelle et cabalistique du Petit Albert*, etc., 1743, 21 p. Among the Kabyles the puberty of young men is determined solemnly in this manner, according to the excellent work of MM. Honoteau and Letourneau, "La Kabylie."

J. N. B. HEWITT.

THE TERRABA LANGUAGE.—The Terraba or Tiribi Indians form at present a small cluster of aborigines dwelling on the west or Pacific side of Costa Rica, Central America. They speak a dialect related to all the other Costa Rican languages, which form one family, and are themselves related to many of the South American tongues of the Maipure connection. H. Pittier, professor of the physico-geographic institute at San José, the capital, calls it neither harmonious nor elegant, but harsh in sound and for us unpronounceable in many of its terms. Another name for it, as he states, is "the idiom of Brurán." With C. Gagini he, in 1892, published an "Ensayo lexicografico sobre la lengua De Terraba," printed at the government printing office at San José, and containing, in ninety pages, the grammatic elements, a long list of words, phrases, sentences, and two correspondences, with interlinear translation.

A. S. GATSCHET.

THE KUSKARAWAOKES OF CAPTAIN JOHN SMITH.

BY WILLIAM WALLACE TOOKER.

Who were the *Kuskarawaokes*, and what was the signification of their name, are questions which have often puzzled those who have delved into the archives of aboriginal history or searched among the tortuous labyrinths of Indian traditions.

The total amount of our knowledge relating to this tribe of Indians is very meagre, and even that brief portion has not been analyzed with the care that it deserves. Their annals, after the departure of Smith from the Virginia colony, was a blank for many years. We can assume that they were frequently visited by Spelman, Argall, Croshaw, and others for the purposes of trade and traffic;* but no one continued the narrative of subsequent events with the historical and descriptive minuteness that characterizes the recital of Captain John Smith the intrepid Englishman. The more we study his works the more we learn and the higher the man rises in our estimation. Would that all who followed in his footsteps had performed their work half so well.

Many causes contributed their portion toward the obliteration of the *Kuskarawaokes* as a tribal organization, and which led finally to the subjugation and absorption of the remnant by neighboring tribes. In consequence, after the lapse of many years, when the settlement of their immediate country was begun by the English, nothing was left but their name as perpetuated by Smith, the decaying shells that whitened the sites of their villages, and the grassy circles that indicated the location of their wigwams.

Rev. Wm. M. Beauchamp, in his recent notes to Cusick's Six Nations,† suggests that Captain John Smith may have meant the *Tuscaroras*, by the *Kuscarawaokes*, a southern tribe. This is an utter impossibility, if we are to believe the linguistic evidence that can be brought to bear and accept what Smith has written upon this subject. The word *Tuscarora* might seem to have some affinity

* Smith's Works, Arber, pp. 503, 511, 586.

† Iroquois Trail, etc., 1892, p. 98.

with the word *Kuskarawaoke*, at the first glance, without due study and research; but the fact that the *Tuscaroras* lived in another section of the country, were of *Iroquoian* stock, spoke their language, and that their name, according to Mr. Beauchamp, should be translated as "the shirt-wearing people," or, as they term themselves, *Skau-ro-na*, "wearing a shirt," entirely prohibits this hypothesis of Mr. Beauchamp. Not only for the reasons given, but the additional one that the name *Kuskarawaoke* is absolutely pure Algonquian, as its analysis proves.

The *Kuskarawaokes* were one of the tribes who were found located, in 1608, on the eastern shore of the Chesapeake bay; consequently were not a southern tribe from Smith's point of view, although they were from an Iroquoian standpoint. In Smith's relation of their discovery* he says: "Repairing our sailes with our shirts we set saile for the maine, and fell in with a pretty convenient river on the east called Cuscarawaok. Here doth inhabite the people of *Sarapinagh*, *Nause*, *Arseck*, and *Nantaquak*, the best marchants of all other savages." He also tells us of the river of *Kuscarawaok*, upon which he found seated a people with 200 men. On his map he locates a king's town called there *Kuskarawaok*, on a river abbreviated to "*Kus fu*." While the surrounding country is marked as being under the dominion of this king, thus intimating that the term applied to all the tribes on the river, Smith's statement that there were only 200 men here would make on a very liberal estimate a total population of five hundred souls. As he mentions only four villages, and *Sarapinagh*, being the first mentioned and possibly the largest, was probably the real name of the one marked on the map as *Kuskarawaok*, and in *Sarapinagh* we find a duplicate of the Long Island, New York, *Sagaponack*, "a hard, ground-nut place," the stream, no doubt, is the one now known as the Nanticoke river. In the opinion of the best authorities, Bozman,† Dr. Brinton,‡ and Mr. Mooney,§ it is considered that the tribe afterward known as the *Nanticokes*—who took their name originally from the village that Smith calls *Nantaquak*, "a point of land on a tidal stream"—included the descendants of all those river Indians

* Smith's Works, Arber, pp. 414, 415.

† Hist. Maryland, vol. i, pp. 112, 114.

‡ Lenape and their Legends, p. 23.

§ Amer. Anthropologist, vol. ii, p. 261.

who had survived the inroads of the *Massawomeks*, the *Sasquesahanoughs*, and other predatory tribes.

Smith imparts some facts in connection with this people which seem to have been entirely overlooked by all who have written upon the subject of the shell-money of the aborigines. It is remarkable that Dr. J. Hammond Trumbull did not recognize its bearing and quote it among his many notes on wampum. The only inference to be drawn from his neglect is that it must have remained unseen, although no one has been more thorough and painstaking in this line of etymological research than he. Prof. William H. Holmes, in his splendid memoir, "Art in Shell of the Ancient Americans,"* by far the best essay ever written on this theme, has also overlooked this passage.

These omissions have been partially due to the scarcity and inaccessibility of the various editions of Smith's works, now made easy of access to all scholars by the editing and publishing of every English edition of Smith's time, in one volume, by Prof. Edward Arber, of Birmingham, England.

The truths given to us by Smith are highly interesting and instructive, and not only bring up problems of Indian trade and traffic, but throw considerable light on what hitherto have been disputed points, as follows: "The cause of this discovery was to search [for] this mine, * * * also to search what furs, the *best whereof is at Cuscarawaoke, where is made so much Rawranoke or white beads, that occasion as much dissention among savages as gold and silver amongst Christians.*"† The furs were not a product of the immediate locality, but were evidently brought from afar by other Indians in exchange for the white beads that were manufactured there. Thus it will be seen that the *Kuskarawaokes* were busy workers in the hive of industry, and that their handiwork was eagerly sought after by far-distant tribes, making them "the best marchants of all other savages." With this evidence from our authority, the name resolves itself into the constituent parts of *Cusca-rawran-oke*. This resolution being made, it will be observed that it derives its name from the same combination of circumstances that gave Roanoke island its appellation twenty-three years previous, or now over three centuries ago.

* Second Annual Report of the Bureau of Ethnology.

† Smith's Works, Arber, p. 418.

The prefix *kusk-*, *kusc-*, or *cusc-*, with the verbal formative *d*, as we find it varied by Smith, denotes the action of making or doing, as he translates it. Therefore it is the dialectic parallel of the Lenape objective-intensive root, *gisch* or *kich*, denoting successful action, of which Dr. Brinton quotes numerous examples.* For instance, *gisch-ihan*, "to create with the hands, to make something;" *gisch-ikhan*, "to finish a house;" *gisch-enachk*, "the fence is finished."† It is also related to the Massachusetts *kezihik*, "to make;" *keste-oog*, "they make." Dr. Brinton remarks: "Numerous other derivations could be added. Howse considers it identical with the root *kitch*, great, large.‡ This would greatly increase its derivations. They certainly appear allied. In Cree, Lacombe gives *kitchi*, great, and *kije*, finished, perfect, both being applied to divinity."§ Dr. Trumbull, in his notes to *kéesuck*, Delaware, *gischuch*, sun, moon, heavens (compare *keskowghs*, sunnes, J. Smith's Vocab.), says: "This word is related to the animate verb *kezheau*, 'he gives life to,' makes alive (and by which Eliot translates the verb 'creates') signifies, primarily, the sun, as the source of light and heat; (2) the visible heavens, coelum; (3) the space of a day, 'one sun,' || while Dr. Brinton suggests that 'the idea appears to be the beginning of a period of time, with the collateral notion of prosperous activity,' " thus agreeing with Dr. Trumbull partly.

The second component, *Rawranoke* (Smith), "white beads," *Rarenaw* (Strachey), "cheyne" [of white beads] = *Roanoac* of Hariot, and *Roenoke* of the later historians.

To my knowledge Dr. Trumbull has never proposed an etymology for the word *Roanoke*, although referring to it as being the southern term for wampum, the shell-money of the north. In this statement he has simply followed the earlier writers, Beverly, Lawson, Byrd, and others. I may be considered overconfident in suggesting, providing Dr. Trumbull failed to discover it, which seems to be evident, but yet its true synthesis can be given, as I hope to demonstrate satisfactorily to those who are interested in this branch of anthropology. In many Indian geographical names occurring on Long Island, New York, the early settlers, both English and Dutch,

* Lenape and their Legends, pp. 102, 103.

† Lenape-English Dict., Brinton.

‡ Grammar of the Cree, p. 175.

§ Lenape and their Legends, pp. 103, 104.

|| Nan. Club, Rep. of R. Williams' Key, p. 104.

as I have previously shown,* frequently, as recorded in various documents, and some retained to this day, made use of the sound *rau* for *wau*, *ron* for *won*, *run* for *wun*, *rin* for *win*, etc., the retention or use of this sound in many instances being an error of the ear (otosis, as it has been termed), a mishearing, or rather misapprehension of the sounds uttered, according to Dr. Trumbull. In other cases the retention was due to ease of utterance, for getting rid of harsh sounds and making the word more euphonious to the ear. In the Narragansett language Roger Williams used *wau* as a contraction for *womp*, "white," † as in *wau-ômpeg*, "white strung beads," -*ômpeg* being a generic suffix to denote a string of shell-money. Therefore Smith's *raw*, Strachey's *rar*, Hariot's *ro*, being the varying prefix of the same word and translated by Smith as "white," is necessarily identical with Roger Williams' *wau*. In the same language he gives us *anawsuck*, "shells," which also appears in the compound word *suckau-anaû-suck*, "the black or dark-colored shells," the terminal -*suck* (= Eliot's -*sog* or -*suog*) being added to denote the animate plural, leaving the verbal radical -*anaw* or *anaû* (= Massachusetts (Cotton) *anna*, "a shell," corresponding to -*anaw* or -*enaw* of Smith and Strachey), thus making *rarenaw* the equivalent of the Narragansett *wau-anaw*, "white shell;" hence by metonymy used to denote "beads," because primarily small shells were simply perforated and strung, or, as Beverly wrote: "Some is made of the cockel shell, broken into small bits, with rough edges, drilled through in same manner as beads, and this they call Roenoke and use it as peak." ‡

In the third component, which is the terminal affix -*oke* (Smith), -*oc* (Hariot), is found the locative generic for "place" or "country," resulting in the synthesis of *Kusca-wau-anaû-ock*, "a place of making-white beads," or with Smith, "where is made so much white beads;" in *Ro-ano-ac*, "a white shell-place." For similar reasons Long Island, New York, was termed *Mitowax* = *Mêht-anaw-ack*, "the land of the periwinkle" or "the country of the ear shell," and also *Seawan-hacky*, "the seawan country," because the first (*Pyrula canaliculata* and *Pyrula carica*) were found in great abundance, as they are to-day, and that seawan, "loose beads," were manufactured there.

* Indian names in Brooklyn, Brooklyn Eagle Almanac, 1893.

† Nan. Club. Rep. of R. Williams' Key, p. 176.

‡ Beverly, Hist. Virginia.

If I should, with Howse and Dr. Brinton, consider the Delaware root *gisch*, Powhatan *kesk*, as being identical or allied with the root *kitch*, Massachusetts *kishki* or *kutchi*, "principal," "great," "large," "preëminent," used as a prefix to many Indian place-names throughout New England and occurring in *Kiskiack*, a king's town on Smith's map, it would not alter the meaning to any appreciable extent, for then the name would be translated as "the principal place of white beads," the idea of making being collateral; all of which is respectfully submitted to those interested in the study of Indian nomenclature and the early history of the Indian tribes of the Atlantic seaboard.

THE GUNDESTRUP SILVER VASE, discovered in 1891 at the bottom of a peat deposit at Gundestrup, in central Jutland, Denmark, has been fully described in a splendid quarto monograph of 68 pages, by Sophus Müller, entitled "Det Store Solvkar fra Gundestrup i Jylland," published as part second of *Nordiske Fortidsminder udgivne af det Kgl. Nordiske Oldskriftselskab*, Copenhagen, 1892. The vase exhibits relief sculptures on its upper part, both inside and outside, which are interesting on account of their purely Celtic style. It has a diameter of about 27 inches, a height of about 7 inches, and is hemispherical in form. The silver is very thin at the bottom of the vase, but increases in thickness toward the periphery, and the weight of the whole is 8,885 grammes. Some portions of the vase show that it had formerly been thickly covered with gold, and that more than one artisan was engaged in its manufacture. The sculptures exhibit processions of warriors, trumpeters, quadrupeds, fantastic and real; hunters in the act of killing game, and griffins consecrated to the Sun God of the Celts. Among the deities are observed the Celtic god Cernunnos in the act of strangling a ram-headed serpent, and there are also a number of female deities. Fourteen beautiful phototypic plates illustrate the sculptures in their natural size and other reproductions fill the text. A résumé in French by Eugène Beauvois forms part of the work.

ALBERT S. GATSCHET.

**ABORIGINAL REMAINS OF THE PIEDMONT AND
VALLEY REGION OF VIRGINIA.**

BY GERARD FOWKE.

At the time of the settlement of Jamestown four tribes, called collectively the Mannahoacs, occupied the country drained by the upper Rappahannock; they migrated to the westward and their name was lost among the tribes with which they merged. The James river from the Falls to the Blue Ridge belonged to the Monacans, known to history as the Tuscaroras. The ancient remains of the region probably pertain largely to these peoples.

Jefferson, in his Notes on Virginia, describes a mound opened by him near Charlottesville; it was plainly an ossuary containing the bones of those who died at different times or places and were brought hither for interment. He estimates their number at not less than one thousand. He further relates that about the middle of the last century a party of Indians traveling through this section had, without inquiry or instruction, diverged several miles from their road and taken a straight course through the woods to this sepulcher, where they remained several hours seemingly mourning over the dead. Unfortunately, it is not told to what tribe they belonged.

A mound apparently similar in its construction stood near the Rapidan river, in the northwest corner of Orange county. Some years ago the river cut away more than half of it, exposing above the original surface several strata of human bones. The portion remaining covered an area forty-two by forty-eight feet, and as left by the river was about ten feet high; but the central part was afterward hauled away, so that at the time of exploration in the spring of 1892 not more than one-fourth of the original structure remained. In this were found many deposits or beds of decayed human bones varying in thickness from a mere trace to not less than six inches; the largest measured six by fifteen feet in area. There was no regularity in their position; they were scattered throughout the mound at varying levels. Not more than four strata were exposed in any one vertical section, but it was reported that six layers had been found in digging away the central portion. If the earth had been

taken off in horizontal layers, bones would have been found at twenty or more different levels. It was thus evident that the deposits were made at different times as the bones accumulated, each lot being covered with earth and the mound being then left undisturbed until the next general burial. Bones of infants and children were found, while the teeth of some adults were worn down to the neck. Burned human bones in very small fragments were numerous; in the bone-beds they seem to have been placed at random, but when found with the remains of not more than two or three skeletons they extended in a thin layer beneath the uncharred bones of the latter.

The earth beneath the mound to within ten feet of the margin contained circular grave-pits in such numbers that they encroached upon one another until there was scarcely a spot in which undisturbed earth could be found. These graves were of two kinds—one class having a depth of two feet with a diameter between four and five feet, the other not exceeding a foot in depth and less than four feet across. The former usually contained three layers of bony matter at intervals of about ten inches, the latter seldom more than one layer, and that at the bottom, though in a very few there was a second layer a few inches above.

Owing to the decayed condition of the bones and the manner in which they were massed an accurate estimate of the number of skeletons may not be possible, but there were certainly nearly or quite two hundred and fifty, so the tumulus as completed probably contained or covered the remains of nearly one thousand people.

We know historically that the tide-water Indians placed the bones of their dead in houses built for that purpose, and that the Six Nations, of whom the Monacans were one, gathered the bones of the dead and buried them collectively. It is not improbable that the Mannahoacs, being neighbors to both, had similar customs, and as these mounds are in their former territory and at least one of them was visited by Indians long after the whites had settled in the country, it is probable that they belonged to this tribe.

Along the entire length of the James above the Falls aboriginal village sites are numerous. Unfortunately frequent freshets and long cultivation have, with one exception, rendered impossible any systematic examination of them; but their locations, the character of the relics found about them, and the arrangement of such fire-beds and burial places as may still be traced are in close accord

with what we know of modern Indian villages. The most interesting site yet discovered is near Gala Water, in Botetourt county. In excavating for a railway more than two hundred skeletons were exhumed, with a great number and variety of associated relics. No particular notice was taken of them at the time, but later examination of a narrow strip extending about one hundred and fifty feet along one side of the track showed that on a firm substratum of yellow clay with a practically level surface was a deposit of porous black soil containing great quantities of pottery, burned stones, broken implements, bones of various animals, and all the ordinary remains of an aboriginal village site. They were scattered through the entire depth of black soil in such a manner as to show they had accumulated by gradual accretion, thus indicating a long and permanent occupation of the site. Scores of barbecue holes were found, most of them a little more than three feet in diameter, though some were considerably larger, and extending from two to four feet into the clay. These were filled with earth like that in the stratum above, mingled with all the debris incident to an Indian camp-fire, besides many finely wrought celts, arrow-heads, bone implements, and shell ornaments. In only two were human bones found: in one, part of a child's skull, and in another an adult's skeleton, some of the bones much enlarged and roughened by disease.

All other undisturbed human remains were in rudely dug graves, each barely large enough to contain a body, which in nearly every case was doubled into the smallest possible compass, most of them being laid on the side, though a few were on the back. No grave extended more than a foot into the clay, while some of the skeletons lay above it; among them were remains of very young infants and of persons whose teeth indicated extreme age. Some of the bones showed healed fractures; the right hand of one skeleton was missing, and in the side of one dorsal vertebra an arrow-head was deeply imbedded.

No mounds exist along this stream, but in the narrow valleys drained by its upper tributaries a number may be found, so similar in every respect to those farther east and north that no separate description is necessary.

When the Knights of the Golden Horseshoe had attained the summit of the Blue Ridge they looked westward over a vast expanse of prairie and meadow land destitute of timber except along the streams. Less than twenty years afterward the settlers of this valley rode day

after day through grass that reached their stirrups, seeking spots where they could find timber for building their houses. Like Kentucky, this region was utilized as a hunting ground by various tribes north and south, who annually at the close of their autumn hunt set fire to the dry grass to prevent the sprouting of trees and to ensure an abundant pasture the following year. The Delawares and Catawbias warred continually for its possession; the Iroquois, claiming prior ownership, contended with both. Other tribes, chief of whom were the Shawnees, also resorted here. This is true also of valleys between the Shenandoah and the Alleghanies. Traces of village sites are found along all the streams, and mounds or cairns are scattered sparsely over the country. Cemeteries along the South Branch of the Potomac have yielded, along with the ordinary Indian relics, glass beads, iron hatchets, brass ornaments, etc., proving a modern date for them.

The mounds are of three classes: (1) of earth, (2) of stone, and (3) of the two combined in varying proportions. Two miles northwest of Linville is a mound in a creek bottom subject to frequent overflow. Its height has been reduced by cultivation from eight or nine to three feet, and for many years bones have been plowed out. It is not known to what level above the earth they extended, but the mound and the earth beneath to a depth of two feet were filled over a space thirty-six feet in diameter with human bones in the utmost disorder and confusion. Many of the grave-pits contained the remains of only one or two individuals; others held ten, twenty, or even more skeletons. Where there were not more than two or three skeletons in a grave, relics would be found with them; this was especially the case with infants, with all of whom were quantities of shell beads. Where many skeletons had been piled together, either in the mound or in the graves beneath, little or nothing accompanied them. A few skeletons had all the bones in their proper relative positions, showing interment soon after death, but by far the larger part of the bones had been thrown in at random. For instance, five or six skulls would be in contact, with not a lower jaw near them; a dozen or more femora or tibia would lie side by side like a bundle of sticks. The largest bone-bed measured ten by twenty-five feet level across the top, a foot thick at the central part, and three feet thick at the ends, where it ended in funnel-shaped depressions. Little piles of cremated human bones were scattered at random throughout the structure; sometimes they had been care-

fully spread out and bodies placed on them, or had been placed in the middle of a stratum of uncharred bones. At one point was a saucer-shaped depression four feet across and sixteen inches deep at the center; in the bottom was a bed of mixed ashes and charcoal three inches thick at the center and gradually thinning out up the sides. On this were the arm and leg bones of two adults burned almost to a cinder, with no traces of other bones in the same condition. Above and in contact with them was a spinal column with the vertebræ in their proper positions, and some fragments too decayed for identification. At one end of this was a skull, at the other part of a humerus; none of these showed the slightest trace of fire.

Among the relics were thousands of discoid and marginella shell beads; quantities of columellæ drilled through lengthwise, of which one hundred were over four and a half inches long; thin, delicately worked flint implements; red and yellow ochre; quartz crystals; highly polished celts; steatite and clay pipes; numerous bone needles, perforators, and polishers; and, chief in interest, two ornaments resembling an old-fashioned "tuck" comb, one of them seventeen and a half inches long, the other somewhat shorter, both showing traces of red and black coloring matter. The last were found in grave-pits, beneath skulls; they appear to be bone, but the variety of bone has not yet been ascertained. Owing to the confusion in which the bones were mingled, the number of skeletons could not be determined with exactness. Omitting all cremated fragments and all pieces that may have belonged with those counted, there were three hundred and eighty-eight skulls. As skulls have been dug and plowed out for many years and the mound much reduced since the first were found, it is probable this was the communal burial place of fully eight hundred individuals.

There was no village or camp in the immediate vicinity, or at least where the earth was obtained, for the structure contained no burnt rocks or earth, no ashes or animal bones, and very few pottery fragments or flint flakes. Generally the skeletons had been laid on the surface of the mound as it stood at the time and covered with soil, but there were indications that graves had been dug to different depths at various times during its construction. Every infant's skeleton was extended to full length, while all others, even children, outside of the bone-beds were closely folded.

Mounds like the above are all found in fertile alluvial bottoms,

while such as will next be described are found on top of ridges or head-lands.

Near Rileyville, Page county, extending transversely across a narrow ridge, is a mound sixty feet long, twenty to twenty-four feet wide, and two to three feet high, being lower and narrower at the middle than nearer the ends. There is a shallow ditch along each side, from which the earth was taken to construct it, and the top is covered with a stratum of bowlders from ten to fifty pounds in weight.

Excavation proved that it was built at three different periods. Two circular mounds were constructed about twelve feet apart on an east-and-west line and the space between afterward filled in, though not to an extent that made the structure symmetrical. The western mound covered two graves: one, near the western edge, measured six feet by eighteen inches; it had been partially refilled with earth—an unusual feature in this region—and bowlders piled over it. A copper crescent six inches long and some triangular black flint knives were in it. The second grave, near the center of the mound, was six by four feet and filled with bowlders, which gradually increased in numbers until at the top of the mound they covered a space eight feet across. This contained a large gorget and two pieces of quartz crystal. Midway between the mounds were two graves, each three by five feet; nothing was in these. Six feet beyond them was one exactly similar.

Across the middle of the eastern mound, on a line nearly north and south, were four pits. The one nearest the northern edge was one by five feet, devoid of contents. The next, six inches wider, contained three gorgets and a large sheet of mica. The third was circular, three feet in diameter; at the center were a paint-cup and a finely polished platform pipe of blue sandstone. The fourth grave, near the south edge of the mound, was two by five feet, and yielded a small gorget and a few scraps of mica. Near the eastern margin were two circular graves, one of them three, the other four feet in diameter. The measurements given apply to the bottom of the graves, the top being larger, owing to the outward inclination of the sides, whose slope was quite irregular. None of them extended into the subsoil, which lies about eighteen inches below the surface. No traces of bone were found in any of them. The longer ones were parallel with the longer axis of the mound, and the position of the relics showed the bodies had been buried with the head toward

the east. All except the first were filled to the bottom with stones. Some of these were flat, with one end lying on the edge of a pit, the other at its bottom or on the slope, showing they had been supported by timber or other substances, whose decay had allowed the inner end to fall. This is common in all mounds containing stone.

The stone mounds or cairns differ from the last only in their smaller size, seldom covering more than one grave, and contain no earth except such as has drifted on them. As in the earth-mound remains, all ages are represented. The greatest number of individuals found in any one of these grave-pits was sixteen.

The number of skeletons found in the Linville and other mounds of its class does not necessarily indicate a large settlement in the vicinity. The entire average population of a community of uncivilized people must die within a period of about thirty years, perhaps even less; so that an ordinary Indian village of three or four hundred souls may have as many as a thousand burials in a century.

The mounds composed partly or entirely of stone are very similar in their construction to those which are known to be due to the tribes roving through this territory within the last three centuries, but with the single exception of a fragment of gun-barrel found in a small cairn in Warren county, nothing has been discovered to indicate dealings with the whites. Their situation and method of construction induce the belief that they were constructed to cover the bodies of those who perished on their annual hunting and war expeditions. The cemeteries yielding modern trinkets are at or in the near vicinity of the towns occupied within one hundred and fifty years by representatives of tribes herein mentioned. The beads, arrow-heads, celts, and ornaments are of patterns common to surface specimens in the same localities, as well as farther to the north and west. A majority of the pipes and gorgets closely resemble in form and material those from the mounds of the Ohio valley. Whether this coincidence is due to accident or to relationship or communication of peoples is an unsettled point.

Altogether there seems no reason whatever for attributing any of the remains of this section to an unknown or a very ancient people. It cannot be denied that such may have existed here; but if they did they either left no traces of their presence or these traces are so nearly identical with those due to the later tribes who hunted or

temporarily lived in the country that it is now impossible to distinguish between the two.

The principal trails between the north and the south followed the trend of the valleys; the Blue Ridge and the Alleghanies seem always to have formed definite boundaries between the permanent possessions of the tribes living to either side of these ranges, and parties crossing them did so with the knowledge that they would probably come in contact with hostile peoples.

As the statement has often been made that no buffalo bones have ever been found in a mound, it may not be amiss to mention here that in a mound near Luray, Page county, very similar in its arrangement and contents to that near Linville, the remains of a young animal of this species (identified as such by Dr. D. S. Lamb, of the Army Medical Museum) were found on the original surface of the ground well within the margin of the mound. Only a part of the skeleton was present, there being no trace of the leg or shoulder bones, but the vertebræ were in their proper position, with the ribs extending into the earth above. It was plain that the animal had been dissected on the spot, a part of the carcass carried away, and the tumulus erected over such portions as were not removed. The human bones in this mound, although it stood in a sandy bottom underlaid with gravel, were so decayed that not one could be removed entire, most of them being as soft and sticky as wet clay.

ANNAMITE BETEL CHEWING AND SALUTATION.—To anticipate or to render more harmonious the discolorating effect of chewing the areca nut and betel leaf, the Annamite women invariably lacquer their teeth in advance with a black preparation similar to that which used to be affected by the Japanese, and which makes the open mouth like a yawning sepulcher. Should they scrape off this coating they lose caste. The men sometimes lacquer their teeth, but are usually satisfied with nature's discoloration. It is to the same practice that I suppose must be attributed the total absence in Annam of that agreeable mark of salutation which has been sanctified by the practice of so many ages, viz., the kiss. Lips so tainted could hardly embrace. Accordingly the only kiss of which the Annamite woman is cognizant is to place her nose against the man's cheek and to rub it gently up and down, with a kind of canine sniff.—*Curzon in The Geographical Journal, London, Sept., 1893.*

THE WORLD'S FAIR CONGRESS OF ANTHROPOLOGY.

BY W. H. HOLMES.

The scheme of calling together a comprehensive series of congresses as an auxiliary feature of the Columbian Exposition at Chicago was worthy of the great occasion, and on the whole, so far as realized up to date, the undertaking has proved a decided success. In some cases, notably the Congress of Anthropology, the task of unfolding and carrying out the scheme fell to the lot of very busy men already overburdened with executive duties pertaining to the exposition. There was consequently in this particular case a lack of pre-arrangement and preparation, and the program was made up from such papers and materials as could be prepared or assembled on very brief notice. It could not be expected that a congress called together under such circumstances would be signalized by the presentation of a large number of papers of the highest order. Many prominent American students of anthropology were unable to be present, and foreign countries were necessarily in large part unrepresented. The meeting did not, therefore, rise fully to the dignity expected of an international congress, but there were enough earnest workers on hand to fill out the week's program and bring out of the heterogeneous elements results of very considerable importance.

The opening ceremonies, on Monday, August 28th, were conducted in the Assembly Hall of the Art Palace, where an address of welcome was delivered by Mr. C. C. Bonny, President of the Congress Auxiliary, and responses were made by Prof. F. W. Putnam, Director of the Department of Anthropology, and Dr. D. G. Brinton, President of the Congress of Anthropology.

The Congress then assembled in the hall assigned to it in the Art Palace, and was opened by Dr. Brinton, who, in an address on "The Nation as an Element in Anthropology," presented a thoughtful and able exposition of the methods and purposes of modern anthropology. In illustration of his theme, the author traced the development of mankind and social institutions from the primitive state through successive stages to the present condition,

in which development proceeds rather through institutions inspired by the mind of man than along the lines of organic evolution. It was shown that sociology, one of the most intricate branches of modern anthropology, is destined to greatly modify, if not to replace, the more primitive statecraft based on superficial studies of individuals; for sociology is the real science of human institutions which themselves express the emotions, convictions, and experiences of the human species. The especial aim of the address was to exhibit the profound changes brought about by the transition of the social condition from the totemic, gentile, or tribal stage to that of national existence. This was shown to be necessarily associated with far-reaching modifications of the physical man, through the destruction of clan marriages and of matriarchal and patriarchal systems, as well as through other causes; and to lay the foundation for a true ethnic (in place of a tribal) psychology, based on new and often contrasting conceptions of religion, ethics, and jurisprudence. The speaker closed with an expression of belief that the national is not the ultimate stage in sociological evolution, but that it will be followed by an international regime, when neither races nor States will be in antagonism, and that like aims, directed to the benefit of the whole species, will be recognized and pursued by leading minds everywhere.

Beginning with Tuesday, the sessions were held in Recital Hall and Agricultural Assembly Hall, in the exposition grounds. The forenoons were devoted to papers classified under the heads of physical anthropology, ethnology, archeology, folk-lore, religions, and linguistics. The afternoons were taken up mainly with discussions relating to the rich anthropologic materials brought together by the exposition and in the examination and study, under personal direction of the exhibitors, of the more important collections.

Physical Anthropology.—Physical anthropology received a fair share of attention during the meeting. Papers were read by Dr. Franz Boas, secretary of the Department of Anthropology; Dr. Gerald M. West, of the same department; and Dr. Manuel A. Muñiz, chief medical officer of the Peruvian army; and the discussion of the physical laboratories of the Department of Anthropology brought out much that was new and instructive.

Dr. Boas gave an exhaustive summary of the known physical characteristics of the American Indians, in which anthropometric determinations were grouped by natural geographic divisions and

in other ways. The relations between individuals and groups were considered, and the influences of environment, both individual and tribal, were judiciously discussed. In its wealth of details, as well as in its wide-reaching discussion of internal and external influences that affect the primitive human organism, the paper was a noteworthy contribution to American anthropology.

Dr. West, in a paper on "Anthropometry of North American School Children," presented statistical data of much value gathered from a series of exhaustive observations and measurements.

Dr. Muñiz exhibited a remarkable collection of crania illustrating prehistoric trephining, an abstract of his memoir on that subject being presented in English by Mr. G. A. Dorsey. The collection, embracing nineteen crania, was made in Peru, and the specimens show that the operation was performed in the most primitive way, commonly, if not invariably, with rude stone implements, and was frequently successful, one individual having survived three operations. The indications are that the operation was commonly performed to relieve depressed fractures of the skull (probably produced by sling-stones) or paralysis resulting therefrom. Dr. Muñiz's collection is by far the richest ever made.

Ethnology.—One morning session was devoted to the reading of papers on ethnologic subjects, the opening paper, by Dr. Brinton, treating of the "Alleged evidences of ancient contact between America and other continents." It was confidently affirmed that tangible evidences of such contact do not exist in any department of American physical or cultural phenomena, and that the analogies on which the theory of contact is based are purely adventitious, arising from correspondences in man and his environment. In the discussion that followed, this view was combatted by Professor Putnam, who presented cases in which the resemblances of phenomena were so marked and the conditions of occurrence so peculiar as to warrant serious challenging of the conclusions reached by the author. Prof. O. T. Mason, Mr. F. H. Cushing, and others took part in the discussion. Professor Mason opposed the views of Dr. Brinton, maintaining that contact was a constant condition to-day in the Behring Sea region, and that interchange has probably not been entirely interrupted for any considerable period of time since the occupation of the American continent began. Mr. Cushing supported Dr. Brinton, taking the position that foreign influences have certainly not been sufficiently strong to seriously affect the trend of

purely American cultural development, and pointing out the fact that as a rule the striking features of native art and institutions can be traced back to their ultimate sources in America.

The arguments, on the whole, may be regarded as inconclusive with respect to the particular analogies to which attention is most frequently called, but there is little doubt that American arts and institutions are flavored with elements, recognizable or not, of the culture of Asia and the Pacific islands, infused from time to time during the occupation of the western continent.

Mr. Walter Hough followed with a paper on "Bark cloth, the primitive textile;" Mr. George A. Dorsey described "A peculiar observance of the Guichua Indians of Peru," and Mrs. M. French-Sheldon made some remarks on "Customs of the natives of East Africa."

Mr. Hough described the art of preparing bark fabrics in common use in tropical and subtropical countries, including Central and South America, the West Indies, Africa, southern Asia, and the Pacific islands. The use of the grooved wooden club or beater was described and its probable relationship to the ribbed stone implements of Mexico pointed out. It was shown that the method is operative only when the filaments of the bast are properly interlaced, the industry being necessarily limited to regions yielding the proper varieties of bark. The art in many cases preceded the use of the loom, and the cloths produced, which were much varied in weight and texture, served numerous and important purposes.

The art of music among our American aborigines received attention in two interesting papers, the first by Miss Alice Fletcher on "Love songs among the Omahas," with vocal illustrations most pleasingly rendered; the second by Mr. J. C. Fillmore on "Primitive scales and rhythms," with demonstrations at the piano-forte. These papers seem to go far toward establishing the theory that the indefiniteness of primitive scales, even the variations of notation noticeable in the same song sung by different individuals or by the same singer at different times among Indians, is due to a distinct, although probably unconscious, feeling for harmony—a seeking after those harmonic chords natural to the scales in which these songs are thus approximately sung. This was illustrated by the fact that the mere melody of an Indian's song, if recorded, then played to him on the piano, was rarely recognized by him; but if played with the harmonic chords proper to it, was almost invariably recognized and

approved. If this claim be true, then primitive songs are simply the undeveloped state of the music of civilization. The fruition of these studies will be looked forward to with exceptional interest.

Dr. Carl Lumholtz spoke of the "Cave Dwellers of the Sierra Madre," the address being much abbreviated owing to lack of time for its presentation. Two tribes, the Tarahumar and Tepehuan, semi-sedentary in their habits, build and periodically occupy scattered dwellings in the caves and rock shelters of the mountains of Chihuahua. They cultivate the soil to a considerable extent, and their arts of pottery, weaving and basketry are decidedly primitive. Their habits and customs as described are of great interest to the student of the tribes of the southwest. Dr. Lumholtz' archeologic collections obtained from the ancient ruins of the same region are of great importance, filling, as they do, a gap in the chain of art groups connecting the Pueblo region of New Mexico and Arizona with the valley of Mexico. A paper dealing with South African ethnography and containing much matter of value was presented by Mr. Richardson, of Cape Town, and Mr. Wildman treated of the culture of the Malay peninsula.

Prof. O. T. Mason, curator of anthropology in the National Museum, read a paper on "Aboriginal American Mechanics," in which he set forth the culture status of the American aborigines with respect to their industries and practical arts. The subject was discussed under the headings of tools, metric apparatus, the application of mechanical principles, engineering and machinery. It was shown that the Americans displayed great ingenuity, patience and coöperation in an area which furnished no other domestic animals save the dog and the llama. The continents were divided into culture or technographic areas, each of which developed its own characteristic activities and in each the native mind had reached to as high a degree of perfection as could be expected of men under their peculiar limitations of environment.

Archeology.—The leading contributions to the archeologic section of the program were papers by Prof. G. H. Perkins, on archeologic investigations in the Champlain valley; Mr. H. C. Mercer, on a flaked stone from the gravels near Madrid, Spain; Mr. Harlan I. Smith, on the anthropologic work of the University of Michigan; Mrs. Zelia Nuttall, on "The Mexican Calendar System," and the various discussions relating to the collections brought together by the exposition.

Mrs. Nuttall's investigations of the Mexican calendar appear to furnish for the first time a satisfactory key to this most highly developed and hitherto most mysterious of all aboriginal American cultural achievements. Without the admirable and ingenious tables and diagrams presented by Mrs. Nuttall, the explanation given by her of so highly complicated a system cannot, howsoever simple, be made plain. The paper was commented on by the president as epoch-making in the progress of such studies in the field of American anthropology, and its great importance as a general contribution was further evidenced in the discussion. It was shown by Mr. F. H. Cushing that a system like the one described by Mrs. Nuttall would almost inevitably result from the naming, symbolizing, and recording of the times and days of such ceremonials as, in an orderly succession corresponding to that of the seasons and phases of the sun and moon throughout the year, are still performed by the priests of Zúñi according to their membership in one or another of the thirteen successively graded cult societies of their tribe. In this way, too, Mr. Cushing thought, the origin of the remarkable permutations of thirteen and twenty, which Mrs. Nuttall has discovered to be so characteristic of the Mexican calendar, may be explained as in all probability developed out of purely mythical and ceremonial requirements into mathematical combinations astronomically correct.

Folk-lore and Religion.—The list of papers presented in these divisions of the program are as follows: "Ritual regarded as a Dramatization of Myth," by Mr. W. W. Newell; "Ritual of the Kwakiutl Indians," by Dr. Franz Boas and Mr. George Hunt; "Walpi Flute Observance," by Dr. J. Walter Fewkes; "Folk-lore of Precious Stones," by Mr. G. F. Kunz; "The Historical Study of Religions," by Mr. M. Jastrow, Jr.; "An Ancient Egyptian Rite," by Mrs. Sarah Y. Stevenson, and "A Chapter in Zúñi Mythology," by Mrs. Matilda C. Stevenson.

In his paper on "Ritual regarded as a Dramatization of Myth" Mr. Newell argued that there are good reasons for considering myth and ritual as two correlated and equally important elements of worship. The ceremonial part cannot be separated from the mythic, for the myth enters into the ritual either by recitation or allusion. Beside, it appears that all religious ceremonies of a gentile or social character contain an element of dramatization. Such is, at any rate, the case with existing faiths, and there is no

reason to deny the principle of historic continuity. In American Indian dances part, at least, of the observance consists in the acting out of myths. The same thing appears to be true of the ancient mysteries, as, for example, those of Osiris. It is difficult to understand why the action should be regarded as in itself more essential than the idea which it represents. It is in modern survivals that we must seek the true character of ancient worship, of which literary reports are so defective. A religion can be understood only when both the myth and the rites are comprehended.

Dr. Fewkes, speaking of "The Walpi Flute Observance," said that abbreviated dramatizations of mythological events, migration legends or historic events, or all three combined, occur in all the nine days' ceremonials of the Hopi Indians. The Walpi flute observance illustrates by dramatization better than any other a historical episode and adds new facts supporting the belief in the composite nature of the Hopi stock. The Hopi legend of the settlement of their country is that the first people to settle on the East Mesa were the Snake and Bear peoples. The next arrival was the Flute people. A realistic dramatization of their reception is biennially performed at Walpi as an episode in the Le-ten-tū or flute observance.

The paper of Mrs. Sarah Y. Stevenson related to a recently discovered and very ancient papyrus, which contained an account of ceremonials pertaining to the ritual of the dead. Of special significance is the manner in which the statutes used in the rites were made alive by elaborate dramaturgic performances and the opening of their eyes and mouths by means of pigments significant of life. The paper of Mrs. M. C. Stevenson described the clan system of the Zuni and the nature and significance of their worship of water in its various forms.

Languages.—Two papers—the first by Doctor Brinton, on "The present Status of our Knowledge of American Languages," and the second by Doctor Boas, on "Classification of Languages of the North Pacific Coast"—were the only contributions to this division of the program. Doctor Brinton said that the Eskimo and Athapascan and other languages of the extreme north have been carefully studied and much material is accessible regarding them. Those of the northwest coast have received fruitful attention from Doctor Boas. In the United States the Bureau of Ethnology has

prepared an excellent linguistic map of the whole country, which leaves few points of relationship uncertain. A similar plan of investigation has been inaugurated by the Mexican government, but its results have not been published. There is much to be done in that republic, and there is little doubt that wholly unknown stocks will be found there. This is not the case in Central America. We may be reasonably sure we have specimens of every language there spoken. The opinion has always prevailed that there are more linguistic stocks in South than in North America. This is probably an error. Recent studies tend very notably to reduce the many dialects of that continent to a comparatively few stocks—fewer than in North America. The regions which offer the richest fields for the linguist are central and southern Brazil; the highlands of Bolivia and the country to the east of them; the Gran Chaco, and southern Patagonia. In all these districts there are few workers, and much entirely new matter to be collected. Much also remains to be done in publishing manuscript material on American languages.

Doctor Boas said that the languages of the North Pacific coast may be arranged according to their morphology into a number of groups; that, morphologically, languages that show no lexicographical connection show decided relationships; thus Tlingit, Haida, and Athapaskan show decided points of resemblance. In the same way Salishan, Kwakiutl, and Chimakuan represent a type by themselves; a third type is the Tsimshian, a fourth one the Chinook. He stated that this method of grouping would probably give fruitful results when applied to other American languages.

The writer of this review was unfortunately absent from the sessions during the reading of a number of important papers and reports upon such are necessarily omitted. It happened also that a few papers were read by title only. Among these are "The fall of Hochelaga: a study in Folk-lore," by Horatio Hale; "A Central group of mounds in Great Britain," by John S. Phené; "Affinities of Egyptian and Indo-European languages," by Carl Abel, and others. It is also probable that by oversight a number of papers deserving mention have been omitted from this review.

An evening lecture on "The Transvaal Country" was delivered by Dr. Mathews, of England. A large number of views were thrown upon the screen and described. In addition, some valuable statistical and historical data were presented.

Consideration of Collections.—The Congress devoted its afternoon sessions to the discussion and study of the extensive collections of anthropologic materials brought together by the exposition. Discussions relating to collections of the Department of Anthropology included papers and addresses by a number of gentlemen connected with the exhibits and others especially qualified to discuss them. Professor Putnam reviewed the history of the department and the progress of the great series of explorations and investigations conducted under his direction. He passed hurriedly over the more important features of the multitude of exhibits brought together by agents of the department and by individuals, states, societies, educational institutions, and foreign governments, and concluded by explaining to the congress his plans and hopes with respect to the prospective outcome of his prolonged and arduous labors—a great anthropologic museum to be established in Chicago.

Papers were read by Dr. Boas and Prof. Joseph Jastrow on the work of the department laboratories, the former treating of physical researches and the latter of psychical phenomena and the methods and appliances of their study. The fine equipment of these laboratories is one of the notable features of the department, and the collaborators have initiated their respective studies in a way that promises results of the very highest importance. It is to be hoped that the favorable conditions under which the work is begun may continue a series of years.

The subject of games was introduced by Mr. Stewart Culin, and remarks were made by Mr. F. H. Cushing, Capt. J. G. Bourke, and others. The collections relating to the evolution of games and the history of gaming brought together by Mr. Culin are of the greatest interest and importance, his exhibit taking a foremost rank among the great group of collections in the Anthropological Department. In completeness of arrangement and exhaustiveness of presentation it surpasses anything of the kind yet seen in any part of the world. This was emphasized by the discussion of the subject before the congress. Mr. Culin, in his rather brief remarks, brought forward surprising examples of analogies between the games of unrelated and even antipodean peoples. These analogies Mr. Cushing explained (as probably indicating independent development along identical lines) in his address on the derivation of gaming from divination with arrows, and on the development and marvelous number and diversity of these arrow-games in America, as so well shown in Mr.

Culin's collections and examples. Captain Bourke, in closing the discussion, affirmed also the more or less sacred and divinistic character of all true primitive American games.

Other papers relating to the department collections were as follows: By Mrs. Zelia Nuttall, on exhibits of Mexican archeology; by Mr. G. A. Dorsey, on his rich and varied collections from South America; by Dr. Emil Hassler, on the ethnology of Paraguay and his unrivaled collections of native feather-work from that region; by Ernest Volk, on "Cache finds from ancient village sites in New Jersey," in which it was shown that in two cases the villagers had brought together small hoards of rudely shaped pieces of argillite; and by Mr. F. H. Cushing, on the "Cliff Dwellers," in which the place of their peculiar culture development was shown to be probably intermediary between that of the archaic nomad and the highest phases of progress in the region. It was also made apparent that the Zuffi Indians were formerly cliff-dwellers, as, according to the best scientific authorities, were other tribes of the region at one or more periods of their history, the occupation extending down to the present period in well-verified cases. It may well be noted here that these conclusions were antagonized by the extraordinary and utterly unreliable teachings of the principal exhibitor of cliff-dwellers' remains on the exposition grounds, through whose agency many erroneous notions respecting these remains have been disseminated among the people of the country.

One afternoon session was devoted to papers relating to anthropologic exhibits in the Government building, where the Smithsonian Institution, National Museum, and Bureau of Ethnology had brought together a display, consisting largely of new and valuable materials relating to ethnology and archeology. Prof. O. T. Mason, representing the National Museum, explained the plan on which the ethnologic exhibit was made. The well-known map of linguistic families north of Mexico, prepared by Major J. W. Powell, was taken as a basis on which to assemble the materials. The aim was to have each leading linguistic stock of peoples represented by collections of art products and by groups of life-sized figures engaged in characteristic arts and industries arranged serially in the alcoves. The groups illustrate the arts of weaving, basket-making, pottery, milling, baking, tanning, stone-working, silversmithing, bark-writing, pictography, etc., and various games and ceremonies. Numerous other figures are intended to illustrate costumes, physical characters,

habits, and customs. Lack of time for preparation and limitations of space prevented the full development of a scheme that promises to be of much importance in object-teaching and museum arrangement. The linguistic stock map aided the speaker in setting forth the distinctions to be drawn between the four fundamental concepts of ethnology, to wit: 1. Blood or race, which is a purely zoölogical idea; 2. Languages, studied in themselves and as indices of race; 3. Nationality, which is a purely social notion; 4. Arts, which belong even more to region than to tribe or language or race.

Mr. W. H. Holmes, representing the Bureau of Ethnology, called attention to the exhibits of archeologic material made by the Museum and Bureau. The principal exhibit illustrated systematically for the first time the arts of mining and quarrying and the manufacture of stone implements by the aborigines. Illustration of the history of flaked stone implements by the classification and grouping of quarry-shop products was the leading feature of the exhibit. Diagrams were presented intended to show that stone implements must be studied in the same manner as the naturalist studies living creatures. There is a development of the individual implement from its inception in the raw material through a series of stages to the perfected state. There is an evolution of species, beginning with the first stone implement shaped by the hand of man and advancing through the ages, changing, specializing, and differentiating until the various groups, the species, orders, and families are developed. A full and correct interpretation of the varied phenomena of implement-making is essential to the student who would venture to employ the products of men's hands in the elucidation of his early history.

Mr. F. H. Cushing, of the Bureau of Ethnology, spoke of the Zuffi dramatic recital of the epic ritual of creation illustrated in the exhibit by a group of the three leading priestly characters engaged in that ceremonial.

Dr. Cyrus Adler, curator of religions in the National Museum, described the exhibit illustrative of the history of religions and reviewed the subject of the representation of his department of investigation in the museums of the world. He described the collections of the Musée Guimet at Paris, the Lateran Museum at Rome, the Arab Museum at Cairo, and other religious collections, as well as special displays, such as the Papal exhibitions in Rome in 1887, the Anglo-Jewish exhibition in London in the same year, and others.

In concluding he outlined a scheme for a section of religions in the United States National Museum, which is to be set up in the near future.

The wonderfully varied exhibits of the Columbian Exposition afforded ample diversion to the members of the congress. One evening was spent witnessing dances of the Kwakiutl Indians of the northwest coast, and visits to the Midway Plaisance, with its American Indian and Eastern primitive villages, oriental and barbarian dances, oriental jugglers, trained animals, ancient Greek portraits, German museum, etc., were features of the occasion. The closing event on Saturday evening was a dinner served at the German restaurant, on which occasion speeches of gratulation and farewell were made.

Concluding Remarks.—The Anthropologic Congress of itself probably marks no epoch in the history of the science of anthropology, taking rather the character of a suitable and withal satisfactory feature of the Columbian Exposition, serving an important function in giving emphasis to the value of the great assemblage of anthropological material there brought together. The great richness of the American field of investigation was made apparent to all. The importance of the outcome of the whole group of anthropologic features connected with the fair depends largely on the action of Chicago with respect to the opportunity of the century in museum-making.

A plan has been matured looking to the publication of the proceedings of the congress. Members have raised a fund of upward of five hundred dollars, but it is estimated that one thousand dollars or more will be necessary to publish the volume of some five hundred pages required to accommodate the papers in a complete form. It is much to be regretted that the exposition did not provide for the publication in good style of the reports of all the congresses auxiliary, for they mark (not in all cases, however, as they should mark) the status of progress in all departments of culture at the present day. No other memorial can hope to compare in permanence and in completeness of record with that made possible by the art of printing, and the published memorials of this exposition must be the bases for comparisons of progress at all succeeding Columbian expositions and, for that matter, all other like celebrations.

ANTHROPOLOGY AT THE MADISON MEETING.

BY W J MCGEE.

The forty-second meeting of the American Association for the Advancement of Science, held at Madison, Wisconsin, August 16-23, 1893, fell below the average of recent years in attendance, but, thanks to the thoughtful hospitality of the good people of the lake-side city, was memorably pleasant. Moreover, the scientific interest of the papers and discussions was quite up to if not above the average, and anthropology received, perhaps, the lion's share of attention. A vice-presidential address, the customary popular lecture, and thirty papers presented before the anthropologic section, besides numerous discussions of importance, indicate the position taken by this science at the meeting. It may be added that while Section H was, through the energy of Vice-President Dorsey, always prompt in beginning work, it was the last to adjourn. The average attendance at sectional meetings, both maximum and mean, was also reached in this section. Thus, as an indication of activity in the branch of knowledge most closely related to humanity, and as a measure of popular interest in anthropology, the Madison meeting was highly gratifying.

The formal address by Vice-President J. Owen Dorsey represented the results of recent researches concerning the Biloxi Indians of Louisiana, of which a few remnants only exist. During Mr. Dorsey's visits to the survivors of this people, in 1892 and 1893, he acquired a quantity of linguistic, mythologic, and sociologic material sufficient to form a volume of several hundred pages, and the address comprised the gist of this material. The significance of the appellations and other denotive terms of the tribe; the earlier habitats and migrations; the past and present condition of the people with respect to habits, customs, and numbers; and the kinship system and marriage laws were severally treated in a philosophic way. Special attention was given to the Biloxi language, which was discussed with respect to phonology, morphology, semasiology (or sematology). In the course of the discussion it was shown

that certain generalizations of Duponceau and Brinton are not applicable to the Biloxi language. Numerous examples of case-endings for nouns and pronouns were given, together with many forms of the imperative mood for the verb, which is highly complex in that the sexes of the person addressed and the speaker are both represented. The morphology of the language is characterized by dependent clauses; a typical sentence given in the address (page 16 of the separate printed copy) comprises five dependent clauses in addition to the stem-clause, while the corresponding English consists of four sentences. The semasiology (defined as "the science of the development and connections of the meanings of words") of the Biloxi is instructive, affording numerous examples both of word-building and onomatopoeia. About 100 onomatopoes have been recorded. Various examples of the curious folklore and mythology of the Biloxi tribe were given.

Among the author's conclusions are the following: (*a*) The Biloxi is one of those languages which is characterized by complexity; (*b*) in the "ground plan" or "plan of ideas" the Biloxi differs notably from the Iroquoian tongues and the Athapascan languages of Oregon; (*c*) the relationship of the Biloxi to other Siouan tongues has been fully established, although it differs from most of the Siouan languages in various respects; (*d*) it would seem that at least a thousand or fifteen hundred years must have elapsed since the separation of the Biloxi, Hidatsa, and Tutelo people from the Siouan tribes found by Captain John Smith in eastern Virginia.

As usual, two or three other vice-presidential addresses touched more or less directly on anthropology. In his discussion of "Geologic Time as indicated by the sedimentary Rocks of North America" before Section E, Vice-President Walcott based a new and highly suggestive estimate of the age of the earth on the accumulation of limestones in the different American formations, deducing a value intermediate between that commonly reached by physicists and astronomers on the one hand and by dynamic and biotic geologists on the other; the estimate for the Cenozoic, including the Pleistocene, being about three million years, and for the entire post-Archean about forty-five million years. In the Section of Economic Science and Statistics Vice-President W. H. Brewer presented a highly suggestive discussion of the "Mutual Relations of Science and Stock-breeding," in the course of which he emphasized the fact

that many domestic animals have been completely reconstructed, practically recreated, through human intervention, and suggested the possible extension of this most beneficent intervention to the human animal. Vice-President Henry F. Osborn, before the Section of Zoölogy, gave a masterly address on "The Rise of the Mammalia," in which the character and conditions of evolution were elucidated, and the kinship of the human organism to lower ancestral types was incidentally pointed out. Before the section of Botany, Vice-President C. E. Bessey, treating of "Evolution and Classification," touched on the influence of human activity in modifying plants; and as an effort to introduce strictly genetic classification in one of the two great branches of life on the earth the address was well worthy the attention of anthropologists.

Dr. Daniel G. Brinton's evening lecture, delivered in the Assembly chamber of the Capitol, was an admirable popular exposition of present knowledge concerning "Early Men." After a summary statement of the data and methods of anthropology, the author discussed the evidence as to the original home, the antiquity, and the dispersion of mankind. He gave reasons for holding that the river gravels and caves of France and Belgium, and perhaps the Iberian peninsula and the British isles, yield the oldest records of human existence; and after making due allowances for incomplete examination of the caverns and fluvial deposits farther eastward, expressed the conviction that the earliest men of the earth came into being somewhere along the mountainous zone extending from the western footslopes of the Alps through the Himalaya nearly to the borders of the Yellow sea. Emphasis was laid on the fact that while certain characters of these earliest men are more distinctly simian and pithecoïd than those of modern times, yet their bones and art products indicate that they were distinctively men, thinking and speaking, possessing upright stature, acquainted with and at least in partial control of fire, and masters of many rude but essentially human arts; so that the researches of archeology have made little progress in tracing mankind toward the lower ancestry of necessary hypothesis. By the association of human relics with glacial and aqueoglacial deposits and with extinct or displaced animals, the date of human origin in the Eurasian continent was thought to be carried backward in time beyond the last ice invasion of the Pleistocene. Touching on the question of the peopling of the Ameri-

can continent, the author gave consideration to the indications of Asiatic invasion across Bering strait or directly over the northern Pacific, yet held with some strength to his previously expressed opinion that the original immigration was across the northern Atlantic during an earlier geologic period when the arctic climate was milder and the arctic lands more extensive than today.

The following papers were presented to the Section of Anthropology:

Songs of Sequence of the Navajos (illustrated by the phonograph); Dr. Washington Matthews.

The Results of Excavations at the ancient Argillite quarries recently discovered near Delaware river, on Gaddes run (illustrated by specimens); H. C. Mercer.

Indian Migrations; Dr. C. Staniland Wake. (Read by Secretary Moorehead in absence of the author.)

The instinctive Interest of Children in Bear and Wolf Stories; Professor W. H. Brewer.

The Delicacy of the Sense of Taste among Indians (with statistical tables); E. H. S. Bailey.

Caches of the Saginaw Valley (illustrated by specimens); Harlan I. Smith.

Is the Polysynthesis of Duponceau characteristic of American Languages? J. N. B. Hewitt. (Read by title in absence of the author.)

Primitive Woman as a Poet; A. F. Chamberlain. (Read by abstract in absence of the author.)

Some Drawings by Kootenay Indians; A. F. Chamberlain. (Read by abstract in absence of the author.)

Psychology at the World's Fair (illustrated by schedules); Professor Joseph Jastrow.

Some Account of the Purification Ceremonies and the Sacred Stone in use among the Mission Indians of California (illustrated by specimens); H. N. Rust.

The Indian Stone Adzes (illustrated by specimens); H. N. Rust.

Some facts concerning the Obsidian Blades called Swords, from northern California (illustrated by specimens); H. N. Rust.

Observations in regard to the use of Argillite by prehistoric People, made from Explorations of ancient Village Sites in the Dela-

ware valley (illustrated by specimens, diagrams, and maps); Ernest Volk.

The Evidence of glacial Man in America; G. Frederick Wright.

The Antiquity of Man in America; W J McGee.

The prehistoric Man of New Mexico; H. S. Herrera. (Read by title in absence of the author.)

Buried Deposits of Hornstone Disks; J. F. Snyder. (Read by abstract in absence of the author.)

A Shawnee Town and its Exploration; W. E. Myer. (Read by abstract in absence of the author.)

Remarks on Sheet Copper Designs from the Hopewell Group, Ohio (illustrated by diagrams); Warren K. Moorehead.

The Ancient Necropolis of Ancon, Peru (illustrated by diagrams); George A. Dorsey.

Another ancient Source of Jasper Blade Material east of the middle Alleghanies (illustrated by specimens); H. C. Mercer.

Remarks on a Mexican Calendar System (illustrated by diagrams); Dr. Daniel G. Brinton.

Theory of Primal Shaping Arts (illustrated by diagrams); Professor W. H. Holmes. (Read by W J McGee in absence of the author.)

Indian Names for the Four Winds and Four Quarters; J. Owen Dorsey.

Notes for an archeologic Study of La Plata Island, Ecuador; George A. Dorsey.

A Ceremony of the Quichua Indians of Peru; George A. Dorsey.

The Sacrifice of the White Dog; C. A. Hirschfelder. (Read by title in absence of the author.)

The Relation between Mythopeia and Euhemerism; Merwin-Marie Snell. (Read by title in absence of the author.)

Revision of Calendar; Ada M. King. (Read by title in absence of the author.)

As usual at recent meetings of the Association, the subject of American archeology received much attention. Perhaps foremost in permanent value among the papers on this subject was that by Professor Holmes on "Primal Shaping Arts." The author's conclusions are based on extended study of American aboriginal art products and elaborate experiments in reproduction of the primitive forms. The phenomena involved in the shaping arts are classified

(1) by material ; (2) by shaping acts or processes ; (3) by function or use of the products ; (4) by culture stage of the artist ; (5) by time periods and order of development, and (6) by peoples or races. The shaping arts themselves are studied to greatest advantage by means of the processes of manufacture, which are classified as follows :

1. Fracturing processes : (a) Breaking
(b) Splitting
(c) Flaking
(d) Chipping
2. Battering processes : (a) Bruising
(b) Pecking
3. Abrading processes : (a) Grinding
(b) Rubbing
(c) Polishing
4. Incising processes : (a) Cutting
(b) Scraping
(c) Picking
(d) Piercing or boring.

It was then shown that the order of development of arts was determined primarily by men's needs, secondly, by the conditions of their environment ; and in this stage the inductive research is aided by deductive reasoning, based on the known course of human evolution in its later stages. Thus, among the primary needs were (1) the need of food ; (2) the needs of defense and offense ; (3) the needs of shelter and clothing, etc. The need for food-getting alone would lead to the development of varied activities, the nature of which would depend on the character of the available food sources as well as on the character of materials available for employment in the nascent arts. Now, both inductive research and deductive reasoning indicate that primal man employed mainly two great classes of stone implements, viz., (1) rounded or blunt stones for throwing, beating, crushing, battering, grinding, etc., and (2) sharp-edged or pointed stones for cutting, digging, piercing, scraping, etc. This was the primitive stage of development or incipient organization, in which many functions are performed by one organ. Then, in the development of stone art, as in biotic evolution, specialized forms came into being, and the implements were differentiated and multiplied until there came to be a multiplicity of forms, each

designed to perform a different function. Now, in tracing the development of form and function, a number of stages may be recognized in the art products: There is the stage of single-act products, *e. g.*, pebbles cleft by a single blow; then multiple-act products, *e. g.*, pebbles or cores fractured and shaped by successive blows; and, finally, sequence-act products, including flaked-chipped and ground-polished implements, in which the simple primal acts prepared the way for more complex acts. Juxtaposing these stages of complexity in shaping acts with the cultural stages of mankind, beginning with savagery and ending with enlightenment, it is evident that the simplest acts correspond to the lowest culture stage; and, proceeding with this comparative investigation, the author developed and illustrated graphically a scheme of evolution of the shaping arts expressed in culture stages. From this scheme it appears that the initial shaping arts were those of the fracturing processes, beginning with the lowest savagery, culminating toward the highest savagery, and declining through the stages of barbarism and civilization; that the second class, comprehending the battering processes, began toward the middle of the stage of savagery, culminated early in the barbarous stage, and then declined; that the third class of arts, comprising the processes of incising, began in savagery and increased slowly through the stage of barbarism, and afterward more rapidly, continuing down to the present; and that the multiple-act or sequence-act arts, comprising the abrading processes, began feebly midway through the stage of savagery, and slowly increased with successive culture stages.

Commenting on the paper, Dr. Brinton pointed out that the scheme of culture stages and art products set forth therein departs from the accepted European classification, which is based on long continued and widely extended investigations, and that the conclusions ought not, therefore, to be accepted without careful consideration. In reply Mr. McGee, observing that the conclusions are admittedly tentative, explained that the classification is indigenous and based essentially on the phenomena of this country, to which the European classification seems in some measure inapplicable. Thus there are in America many stone objects which by European archeologists are classed on the basis of form as paleolithic and interpreted as representing a definite culture stage; but these objects occur on many sites in thousands, even in scores of tons, implying on the European hypothesis a denser savage population than con-

servative students could admit; and partly for this reason a simpler explanation of the phenomena has been adopted by a large group of American archeologists, among whom Professor Holmes is the leader. While, therefore, the classification is by no means final, it is the best thus far proposed for this country.

Mr. Mercer's communication on the ancient argillite quarries of Gaddes run represented essentially a continuation of the researches on Delaware river inaugurated by Professor Holmes. Within a few months it has been shown that in various localities within a limited distance of Trenton the aborigines quarried argillite similar to that from which the well-known Trenton "turtle-backs" are fashioned, and that at or near these quarries workshops were established in which well-shaped blades were manufactured, while the *débris*, including many "failures" undistinguishable in form as well as in composition from the Trenton "turtle-backs," was left behind. Some of these workshops, with attendant "failures," occur on the modern flood-plain of Delaware river, the nearest to Trenton thus far discovered being those described by Mr. Mercer. The discoveries have an important bearing on the question of the antiquity of man raised by the association recorded at Trenton.

Mr. Mercer's second communication was a detailed account of an aboriginal jasper quarry in Pennsylvania, from which material for some of the widely diffused jasper implements of Pennsylvania must have been taken.

In his account of caches in the Saginaw valley, Mr. Smith described in detail a number of caches of stone implements recently discovered by him in the eastern-middle portion of the lower peninsula of Michigan. Special and most exemplary efforts were made by the author to trace the material of which the objects were made to their sources in neighboring geologic formations and in prehistoric quarries, and these efforts were fortunately attended by a fair measure of success.

Mr. Rust exhibited some remarkably fine specimens of the stone tubes so abundant and so puzzling to archeologists on the Pacific coast, describing their connection with ceremonials of the Mission Indians of California. He also exhibited an interesting collection of stone adzes illustrating the attachment of handles of bone and wood by means of sinew and a highly tenacious gum made from native asphaltum. In addition he laid before the section a magnificent flaked and chipped obsidian blade, detailing the circum-

stances under which it was obtained from a living Indian, and mentioning the high value and superstitious significance attached to it by its former owner.

Mr. Volk presented an extended and admirable communication setting forth the results of excavations and observations made, under the auspices of the Peabody Museum, by direction of Professor Putnam, at Trenton. The occurrence of argillite "turtle-backs" and other human relics at various depths in the surface deposits was illustrated by diagrams and sections. The author personally obtained various relics from the surface soil and superficial gravels and sand beds associated therewith, the argillite objects being sometimes associated with fragments of pottery. The depth at which the objects were found was not, however, greater than that reached by the tap-roots of deep-rooted trees, while the pottery and finished implements appear to represent the work of the modern Indians.

Judging from the attendance, the most interesting discussion of the section, and indeed of the meeting, was introduced by the papers of Professor G. Frederick Wright and W. J. McGee, summarizing the supposed evidence of high human antiquity in this country. Professor Wright* enumerated the discoveries at Newcomerstown and Loveland, Ohio, and defended the early work at Trenton, alluding also to the discoveries at Little Falls, Minnesota, and on the Pacific coast. From these discoveries he argued at some length the glacial or preglacial age of man in America along lines laid down in recent popular publications. Mr. McGee mentioned several unpublished discoveries which at first sight appear to indicate the existence of man in this country before the end of the glacial period, and described also the finding of an obsidian implement in the late Pleistocene of Nevada, accounts of which are in print. He then contrasted legal evidence and procedure with scientific evidence and methods, pointing out that the lines of reasoning are essentially diverse, and laying down the principles that in science conclusion is not imperative unless the evidence is ample, that all scientific conclusions are tentative only, and that unsupported testimony is nugatory.

The papers by Messrs. Volk, Wright, and McGee were discussed together by Professor T. C. Chamberlin, Professor F. W. Putnam,

* Not to be confounded with the geologist of Oberlin, Professor A. A. Wright.

Dr. H. C. Hovey, Professor E. W. Claypole, Professor C. R. Van Hise, Mr. Warren Upham, and others, including the authors. Professor Chamberlin called attention to the fact that the alleged evidences of glacial man in this country enumerated by Professor Wright did not include several instances mentioned by him as indubitable in a previous publication. Using the simile of legal procedure, he pointed out that of several witnesses giving concordant testimony introduced in a previous issue a number have been impeached, admittedly with success, since they were not again brought on the stand; and from this serious decrease in the evidence adduced he argued the weakness of the case for the glacial age of man. He also brought to light a number of inconsistencies in the testimony yet retained by the advocate of high human antiquity, showing that different published statements, including the exhibit at the World's Fair, are inconsistent with each other and with the statements made at the meeting, to the extent that even the Newcomerstown discovery cannot be regarded as worthy of credence by conservative geologists and archeologists. The other cases also were discussed at some length, special attention being given to the possibility of adventitious intrusion through windfall of trees and in other ways. The general conclusion, as stated by Professor Chamberlin, is that the Newcomerstown find is indecisive without more consistent evidence than has thus far been produced, and that the various other finds are even less trustworthy as evidence of glacial man in America. Mr. Upham, on hypothetic grounds, defended the Little Falls discovery, expressing confidence in the first conclusion based on incomplete observation, despite the fact that it has since been abandoned by Professor N. H. Winchell, state geologist of Minnesota, after more extended studies on the ground in company with Professor W. H. Holmes. Professor Claypole discussed at some length the nature of evidence, scientific and legal, in general supporting the principles laid down by Mr. McGee, but urging that in the case in question the evidence should not be completely thrown out of court, and that the question should be held *sub judice*. Professor Putnam expressed confidence in the early work at Trenton, discussing at some length the question of intrusion through wind-felled trees and in other ways, giving special weight to the evidence afforded by a human skull found some years ago in the Trenton gravels by Dr. C. C. Abbott. Dr. Hovey mentioned the finding of an arrow-point in a cavern in such situation as to suggest high human antiquity,

pointing out, however, that in this case, as in those under discussion, the evidence was by no means conclusive. Professor Van Hise introduced some critical inquiries with respect to the supposed association of relics with different deposits, his remarks indicating the opinion, which seemed to prevail among the geologists present, that the supposed evidence on record is by no means sufficient to prove the glacial age of man in America.

Summing up the argument for high human antiquity, Professor Wright defended the testimony afforded by the various discoveries, extolling the legal skill of some of the finders and calling attention to affidavits made by others. The Abbott finds at Trenton were reintroduced, the elaborate researches by Professor Holmes being impugned. The principal Pacific coast phenomena were discussed in considerable detail, special reference being made to the observations by Clarence King and the vicarious records of Becker, and the Nampa imposture, detected first by Dutton and later by Powell, was again brought forward.

In closing the discussion, Mr. McGee remarked that despite the possibility that man existed in this country during at least the last ice invasion of the glacial period the *fact* of his existence at that time in America has not yet been proved beyond question. Some discoveries are open to diverse interpretation; the accounts of others are inherently weak, and the case gains no strength from the multiplication of witnesses when each new witness is as untrustworthy as the old. The important generalizations of science have always been corroborated and sustained by further research, and it was held to be especially significant that the supposed evidences of great human antiquity in this country have not been corroborated or sustained by more extended and more critical researches, but that in all save one or two cases later research has only served to show that the first interpretation was erroneous.

Mr. Moorehead's communication was illustrated by figures showing the outlines of copper objects found in the Hopewell group of mounds. The designs were probably or certainly cut out of thin sheets of copper, though it was not determined whether the sheets were hammered or rolled, and while the designs conform in such manner as to show that set patterns are represented, there is sufficient variation to indicate that the objects were shaped individually

and not stamped by dies. Special attention was directed to designs representing the svastika or fylfot cross, which acquire peculiar interest in view of recent assertions that the svastika is confined to the Eastern hemisphere. In discussing the paper, Dr. Brinton described another form of the svastika, and Mr. G. A. Dorsey described a form found by him while investigating the prehistoric cemeteries of Peru. Vice-President Dorsey also called the attention of the section to another variant, which appears on the war-chart of the Kansa tribe, the survivors of which are now in Indian Territory. A copy of this chart was given to the speaker in 1882 by a hereditary chief of a war gens of the Kansa tribe, who said that it had been in the possession of his ancestors for a long period, and explained that the svastika thereon was a wind symbol.

The principal paper by Mr. G. A. Dorsey was a description of the ancient necropolis of Ancon, Peru, which is in part reproduced in the anthropologic building of the World's Fair. The area assigned to the necropolis is laid out into irregular patches, generally one to three yards across, by means of little embankments of gravel. Each patch may be regarded as a cemetery lot, and is occupied generally by the remains of one, though sometimes of two or more individuals. The bodies are desiccated and form more or less perfectly preserved remains, usually in a squatting posture, with knees drawn to the chin. Each is wrapped in cotton and afterward in many layers of cloth or matting, the whole securely tied by strong ropes.

In his paper on the calendar system of Central America and Mexico, Dr. Brinton remarked that at the time of the Spanish conquest all the semi-civilized peoples of this continent made use of the same calendar, despite the great diversity of their languages. This system is absolutely unique, nothing like it being found elsewhere in the new world or anywhere in the old world. Its basis is a month of twenty days, of which thirteen make a nominal year, and eighteen, plus five days, the solar year. Earnest efforts have been made by writers to detect in these periods the results of astronomic observations, either lunar or solar, or on Venus or other planets, or on constellations, but up to the present time without positive results. The twenty-day period is generally conceded to have been based on the vigesimal system of counting, which was common to all these tribes. Each day has a name and a number, and the author has found by a study of these names that they have

the same meaning in all those languages in which they are preserved. This coincidence proves a common origin, but the place of origin has not yet been established. The author's research leads to the opinion that the system originated with one of the Maya tribes in or near Chiapas. Moreover, he finds reason to suppose that the calendar was at first purely divinitory and astrologic, subsequently becoming a time-count, with a rather awkward adaptation to the solar year of lunar months, such as is found in the northern hunting tribes. The day names are symbolic and appear to be arranged in a sequence corresponding to the ordinary history of human life from birth and youth up to old age and death.

In connection with the work of the section on archeology an excursion was made to examine the Indian mounds about the northern shore of Lake Mendota. The mounds examined include the ordinary conical or dome-shaped tumuli and effigy mounds, together with embankments, all characteristic of the Wisconsin district.

The contributions to psychology and somatology were limited in number, though of great interest. Dr. Jastrow described at length the psychometric methods of the anthropologic laboratory in Chicago, setting forth the objects and purposes of the work. Professor Brewer described his observations on the lively interest manifested by children, and to a less extent by adults, in stories of bears and wolves. He expressed the opinion that, while a part of this interest may be ascribed to the brevity and force of the monosyllabic names, the chief and real reason for the predominance of the idea is to be found in the instinctive fear of these animals inherited from ancestors in parts of Europe in which they abounded at the beginning of civilization. Mr. Bailey's paper on the delicacy of the sense of taste among Indians also attracted much attention. The author presented the results of a large number of tests made on Indian boys and girls, showing by percentages the delicacy of taste for acid, bitter, and sweet substances. This was supplemented by similar tables showing the results of like tests made on an equal number of white boys and girls. While the results of the tests show some aberration, they indicate on the whole a materially higher sensibility among the white youth.

One of the most interesting papers laid before the section was that by Dr. Washington Matthews on the songs of sequence of the

Navajos. The author recited a Navajo legend, interspersed with questions asked by the children of the principal characters concerning the origin and peculiarities of vegetation, etc., together with the parent's replies in the form of mystic songs, the latter given by the phonograph from cylinders bearing records of the songs sung by the Indians themselves in their own tents. In addition to the interest of the subject, the communication was important as illustrating the uses and advantages of phonographic instruments in ethnologic work.

Vice-President Dorsey's paper on Indian names for the four winds and four quarters summarized personal observations among the Omaha, Ponka, Osage, Kansa, Kwapa, and Biloxi tribes of the Siouan stock, and the Tutu tunne of Oregon representing the Athapascan stock, in comparison with the Dakota equivalents recorded by Riggs. In some of these languages the names for the cardinal points differ from those of the corresponding winds. In the Tutu tunne dialect there are distinct names for the northeast, southeast, southwest, and northwest winds, as well as for the corresponding quarters, these names being compounds of the names of the four cardinals.

The paper by Mr. Hewitt was an important contribution to knowledge of linguistics. It is given in full elsewhere in this number of the AMERICAN ANTHROPOLOGIST, together with remarks by Mr. Dorsey designed to show that sundry assertions made by Duponceau and his followers are not applicable to the Siouan tongues and certain other languages.

The officers of the Section of Anthropology elected for the ensuing year are. Vice-President, Dr. Franz Boas; Secretary, Professor A. F. Chamberlain. For the place of meeting in 1894, Brooklyn was provisionally chosen, with the condition that some other eastern city may be selected in its stead by the Council. Preliminary action was also taken with the view of holding the 1895 meeting in San Francisco or elsewhere on the Pacific coast.

Anthropologists throughout the world will doubtless be gratified at the selection of one of their number as the next President of the Association. The honor of election to this office was conferred on Dr. Daniel G. Brinton, of Philadelphia.

A QUARTERLY BIBLIOGRAPHY

OF

ANTHROPOLOGIC LITERATURE.

COMPILED BY ROBERT FLETCHER, M. D.

- Ammon** (Otto). Die natürliche Auslese beim Menschen; auf Grund der Ergebnisse der Anthropologischen Untersuchungen der Wehrpflichtigen in Baden und anderer Materialien dargestellt. Jena, 1893, G. Fischer, 336 p. 8°.
- Amour** (L') aux colonies, singularités physiologiques et passionnelles observées durant trente années de séjour dans les colonies françaises, Cochinchine, Tonkin et Cambodge, Guyane et Martinique, Sénégal et Rivières du Sud, Nouvelle-Calédonie, Nouvelles-Hébrides et Tahiti. Par le docteur Jacobus X . . . Paris, 1893, I. Liseux, 403 p. 8°.
- d'Avout** (A.) Travaux archéologiques dans le département de la Côte-d'Or. Caen, 1893, Delesques, 6 p. 8°.
- de Baye**. Souvenir du congrès international d'anthropologie et d'archéologie préhistoriques (onzième session, Moscow, 1892). Paris, 1893, Nilsson, 45 p. 8°.
- Bloxam** (G. W.) Index to the publications of the Anthropological Institute of Great Britain and Ireland [1843-1891]. Including the journal and transactions of the Ethnological Society of London [1843-1871]; the journal and memoirs of the Anthropological Society of London [1863-1871]; the Anthropological Review; and the journal of the Anthropological Institute [1871-1891]. London, 1893, The Anthropological Institute, viii, 301 p., 1 l. 8°.
- Boule** (Marcelin). La Station quaternaire du Schweizersbild, près de Schaffouze (Suisse), et les fouilles du docteur Nüesch. Paris, 1893, Leroux, 25 p. 8°.
- Donaldson** (Thomas). Moqui Pueblo Indians of Arizona and Pueblo Indians of New Mexico. Washington, 1893, Eleventh Census of U. S., "Extra Bulletin," 97 p. 4°.
- Dubalen** (P. E.) Ancienneté de l'homme dans le Département des Landes. Dax, 1893, Labèque, 5 p. 8°.
- Engels** (Frédéric). Barbarie et civilisation extrait de l'évolution de la propriété de l'état et la famille. Saint-Amand, 1893, Pivoteau, 24 p. 8°.
- Fletcher** (Alice C.) A study of Omaha Indian music . . . with a report on the structural peculiarities of the music by John Comfort Fillmore, A. M. [Forms vol. i, No. 5, Arch. & Ethn. Papers of the Peabody Museum.] Cambridge, Mass., 1893, vi, 152 p. 8°.
- Frœhlicher** (Paul). Considérations sur l'œil en anthropologie; œil anthropologique; aperçu général. Montpellier, 1893, Hamelin frères, 83 p. 8°.
- Gaidoz** (Henry). Un vieux rite médical. Opuscule offert à Anatole de Barthélemy pour fêter le cinquantième anniversaire de son élection comme membre de la société des antiquaires de France, le 9 mai 1842. Paris, 1892, E. Rolland, 84 p. 12°.

- Grabowsky** (Norbert). Die geschlechtliche Enthaltsamkeit als sittliche Forderung und als Vorbeugungsmittel sozialen Elends. Leipzig, 1893, M. Spohr, 30 p. 8°.
- Hirtz** (Eugène). Recherches anthropologiques sur le plan horizontal de la tête; méthode pour le déterminer. Paris, 1893, O. Doin, 68 p., 3 pl. 8°.
- Huxley** (T. H.) Evolution and ethics: the Romanes lectures, 1893, delivered in the Sheldonian theatre, May 18, 1893. New York, 1893, Macmillan & Co. 12°.
- Jacoby** (A. I.) [The extinction of foreign races in the North.] St. Petersb., 1893, 68 p. 8°.
- Krauss** (Friedrich S.) Böhmische Korallen aus der Götterwelt: Folkloristische Börseberichte vom Goetter und Mythenmarke. Wien, 1893, Gebr. Rubenstein, viii, 147 p. 8°.
- Kuchenmeister** (F.) Die Todtenbestattungen der Bibel und die Feuerbestattung. Nach dem Tode des Verfassers herausgegeben von Freunden der Feuerbestattung. Mit einer biographischen Einleitung. Stuttgart, 1893, E. Schweizerbart'sche Verlagshandlung, x, 163 p. 8°.
- Kurella** (H.) Naturgeschichte des Verbrechers. Grundzüge der criminellen Anthropologie und Criminalpsychologie. Für Gerichtsärzte, Psychiater, Juristen und Verwaltungsbeamte. Stuttgart, 1893, F. Enke, viii, 284 p. 8°.
- Lang** (Celestia Roat). Son of man; or the sequel to evolution. Boston, 1892 [1893], Arena Pub. Co., 7 + 281 p. 12°.
- Le Braz** (A.) La légende de la mort en Basse-Bretagne; croyances, traditions et usages des Bretons armoricains. Paris, 1893, Champion, lxxi, 946 p. 18°.
- Leroy-Beaulieu** (A.) Les Juifs et l'antisémitisme. Israël chez les nations. Paris, 1893, C. Lévy, xi, 446 p. 18°.
- Lombroso** (Cesare). Le piu recenti scoperte ed applicazioni della psichiatria ed antropologia criminale. Roma, 1893, frat. Bocca, 438 p., 3 pl. 8°.
- MacDonald** (Arthur). Abnormal man; being essays on education and crime and related subjects; with digests of literature and a bibliography. Wash., D. C., 1893, Gov't Print. Off., 3 + 445 p. 8°.
- Marcy** (E.-J.) et **G. Demeny**. Études de physiologie artistique faites au moyen de la chronophotographie. 1. série, No. 1. Des mouvements de l'homme. Paris, 1893, Berthand, 1. l., 6 pl. obl. 4°.
- Menzalora** (Mariano). La teoria della discendenza nelle malattie umane. Con un saggio di classificazione dal punto di vista filogenetico. Palermo, 1893, C. Clausen, 332 p. 8°.
- Mollere** (Humbert). Archéologie médicale. Mémoire sur le mode de captage et l'aménagement des sources thermales de la Gaule romaine. Lyon, 1893, Rey, 57 p. 8°.
- Morse** (Edward S.) Latrines of the East. Boston, 1893, 16 p. 12°. [Repr. from: Am. Architect, Boston, 1893.]
- Pantukhof** (I. I.) [Observations anthropologiques au Caucase. Présentée à la section caucasienne de la Société imp. de géographie.] Tiflis, 1893, K. P. Kozlovski, 154 p., 6 pl., 4 tab. 8°.
- Pilling** (James C.) Bibliography of the Chinookan languages (including the Chinook jargon). Washington, 1893, Gov't Print. Off., xi, 81. 8°.
- Sanson** (André). L'hérédité normale et pathologique. Paris, 1893, Asselin & Houzeau, 437 p. 8°.
- Vauchez** (Emmanuel). La terre; évolution de la vie à sa surface, son passé, son présent, son avenir. 2. v. Paris, 1893, C. Reinwald et Cie, 372; 397 p. 8°.
- Wolff**. Recherches sur les Aryas. Macon, 1893, Romand, 192 p. 8°.
- Abbott** (W. L.) Ethnological collections in the U. S. National Museum from Kilima-Njaro, East Africa. Rep. Smithsonian. Inst., 1891, Wash., 1892, 381-398.—**Alger** (A. L.) Grandfather Thunder. Pop. Sc. Month., N.

Y., 1893, xliii, 651.—**Alvarez** (L. F.) The Hawaiians. Why are they dying out? Pacific M. J., San Fran., 1893, xxxvi, 407-409.—**Amherst College** (Physical Education Department). On some relations of human stature to muscular strength. Pub. Am. Statist. Ass., Bost., 1892-3, iii, 347-349.—**Ammon** (O.) Wiederholte Wägungen und Messungen von Soldaten. Deutsche mil.-ärztl. Ztschr., Berl., 1893, xxii, 337-370, 3 diag.—**Ardu** (E.) Sulla fessura orbitale inferiore nell'epilettico, nel criminale e nel cretino. Arch. di psichiat., etc., Torino, 1893, xiv, 250-255.—**d'Ault du Mesnil et Capitain**. Recherches géologiques et paléthnologiques sur le loess des environs de Rouen (Note préliminaire). Bull. Soc. d'anthrop. de Par., 1893, 4. s., iv, 304-308.—**Azoulay et Regnault**. Des diverses formes des dents incisives supérieures. *Ibid.*, 266-269.—**Bartels**. Beitrag zur Volksmedizin der Kaffern und Hottentotten. Verhandl. d. Berl. anthrop. Gesellsch., Berl., 1893, xxv, 133-135.—**Bastian** (A.) Ueber die Schöpfungssage der Polynesier. *Ibid.*, 211-217.—**de Baye (Baron)**. Note sur le gisement paléolithique de San Isidro, près Madrid. Bull. Soc. d'anthrop. de Par., 1893, 4. s., iv, 391-400.—**Beclaire** (J. V.) The causation of sex. Physician & Surg., Detroit & Ann Arbor, 1893, xv, 337-340.—**Becker**. Eine Hausurne bei Dessau. Verhandl. d. Berl. anthrop. Gesellsch., Berl., 1893, xxv, 124-129.—**Belok** (W.) Archäologische Forschungen in Armenien. *Ibid.*, 61-82.—**Benedict** (A. L.) A prehistoric dental anomaly. N. York M. J., 1893, lviii, 228.—**Bergonzoli** (G.) Note craniometriche su 26 crani di prostitute. Arch. di psichiat., etc., Torino, 1893, xiv, 321-331.—**Berte** (F.) Il tatuaggio di Sicilia in rapporto alla resistenza psichica. Arch. per l'antrop., Firenze, 1892, xxii, 205-229.—**Bianchi** (S.) Sul nodulo kerckriniano e sua relazione con la fossetta occipitale mediana. Monitore zool. ital., Firenze, 1893, iv, 43-59. — I seni frontali e le arcate sopraccigliari studiate nei crani dei delinquenti, degli alienati e dei normali. Arch. per l'antrop., Firenze, 1892, xxii, 231-249.—**Blake** (L. I.) and **W. S. Franklin**. In regard to

color-blindness among Indians. Science, N. Y., 1893, xxi, 297.—**Bleyer** (J. M.) The influence of climate on temperament. Internat. M. Mag., Phila., 1893, ii, 434-443.—**Boas** (F.) Sagen der Indianer in Northwest-America. Die Mink-Sage. Verhandl. d. Berl. Anthrop. Gesellsch., Berl., 1893, xxv, 228-256.—**Boehmer** (G. H.) Prehistoric naval architecture of the North of Europe. Rep. Smithson. Inst., 1891, Wash., 1892, 527-647, 17 pl.—**Borden** (W. C.) The vital statistics of an Apache Indian community. Boston M. & S. J., 1893, cxxix, 5-10.—**Bourke** (J. G.) The miracle play of the Rio Grande. J. Am. Folk-Lore, Bost. & N. Y., 1893, vi, 89-95.—**Branner** (J. C.) The lip and ear ornaments of the Botocudus. Pop. Sc. Month., N. Y., 1893, xliii, 753-757.—**Bridges** (T.) A few notes on the structure of Yaghan. J. Anthrop. Inst., Lond., 1893-4, xxiii, 53-80.—**Bruckner**. Ergebnisse von Schliemann's letzter Ausgrabung auf Hissarlik (März-Juli 1890). Verhandl. d. Berl. anthrop. Gesellsch., Berl., 1893, xxv, 136-140.—**Buckland** (A. W.) Points of contact between old world myths and customs and the Navajo myth, entitled "The Mountain Chant." J. Anthrop. Inst., Lond., 1893, xxii, 346-355.—**Busch**. Ueber niedere Menschenrassen mit Vorführung einiger menschlicher Rassenschädel. Verhandl. d. deutsch. odont. Gesellsch., Berl., 1893, v, 93-164.—**Cabode**. De la responsabilité criminelle. Marseille méd., 1893, xxx, 444-459.—**Camerer** (W.) Untersuchungen über Massenwachsthum und Längenwachsthum der Kinder. Jahrb. f. Kinderh., Leipz., 1893, xxxvi, 249-293.—**Capitan** (L.) Les Pierres-Closes de Chanas, commune de Saint-Laurent-de-la-Prée, arrondissement de Rochefort. (Charente-Inférieure.) Rev. mens. de l'École d'anthrop. de Par., 1893, iii, 220-226.—**Capitan et Jamin**. Station néolithique de Hogues près Yport (Seine Inférieure). Bull. Soc. d'anthrop. de Par., 1893, 4. s., iv, 269-274.—**Chamberlain** (B. H.) Notes on some minor Japanese religious practices. J. Anthrop. Inst., Lond., 1893, xxii, 355-370, 2 pl.—**Cleveland** (D.) The hillock and mound formations of South-

- ern California. Science, N. Y., 1893, xxii, 4.—**Cocchi** (A.) Ricerche antropologiche sul torus palatinus. Arch. per l'antrop., Firenze, 1892, xxii, 281-290.—**Collignon** (R.) Recherches sur les proportions du tronc chez les Français. Anthropologie, Par., 1893, iv, 237-258.—**Cook** (F. A.) The most northern tribe on earth. N. York M. Exam., 1893-4, iii, 23.—**Curious** (A.) method of anthropometrical measurement for the determination of identity. Pop. Sc. Month., N. Y., 1893, xliii, 864.—**Danielli** (J.) Studio sui crani bengalesi con appunti d'etnologia indiana. Arch. per l'antrop., Firenze, 1892, xxii, 291; 371, 1 pl.—**Deole** (L.) On some Matabele customs. J. Anthrop. Inst., Lond., 1893-4, xxiii, 83-85.—**Dide** (M.) Note sur une apophyse anormale rencontrée sur un fémur humain. Bull. Soc. d'anthrop. de Par., 1893, 4. s., iv, 162-165.—**Dujardin-Beaumetz**. De l'hygiène alimentaire aux origines de la civilisation. Bull. gén. de therap., etc., Par., 1893, cxxiv, 385-395.—**Dumont** (A.) La race et la suette à l'Isle d'Oléron. Bull. Soc. d'anthrop. de Par., 1893, 4. s., iv, 370-374.—**Dunlop** (A.) A contribution to the ethnology of Jersey. J. Anthrop. Inst., Lond., 1892-3, xxii, 335-345.—**Earle** (Alice Morse). Old-time marriage customs in New England. J. Am. Folk-Lore, Bost. & N. Y., 1893, vi, 97-102.—**Eisen** (G.) The ruins of Copan. Great Divide, Denver, 1893-4, x, 17-20.—**Eitel**. Les Hak-ka. [Transl. from: Notes and Queries (about Shanghai), 1867-70.] Anthropologie, Par., 1893, iv, 129-181.—**Elliot** (G. F. S.) Some notes on Native West African customs. J. Anthrop. Inst., Lond., 1893-4, xxiii, 80-83.—**Ellis** (W. G.) The Amok of the Malays. J. Ment. Sc., Lond., 1893, xxxix, 325-338.—**Emery** (C.) Gedanken zur Descendenz und Vererbungstheorie. Biol. Centralbl., Leipz., 1893, xiii, 397-420.—**Evans** (A. J.) On the prehistoric interments of the Balzi Rossi caves near Mentone and their relation to the neolithic caveburials of the Finalese. J. Anthrop. Inst., Lond., 1892-3, xxii, 287-307.—**Ferrarini** (C.) Sulle varietà dell'apertura piriforme umana. Arch. per l'antrop., Firenze, 1892, xxii, 449-457, 2 pl.—**Ferrero** (G.) Criminal festivals. [Transl. from: Rev. scient., Par.] Pop. Sc. Month., N. Y., 1893, xliii, 758-766.—**Ferri** (E.) L'omicidio in Europa. Scuola positiva, Roma, 1893, iii, 248-251. — Il contegno degli omicidi pazzi. *Ibid.*, 398; 446; 481; 543.—**Florian** (E.) Pel diritto di conoscere i fatti criminosi. *Ibid.*, 319-325.—**Fouillee** (A.) Education and selection. [Transl. from: Rev. d. deux Mondes.] Pop. Sc. Month., N. Y., 1893, xliii, 349-356.—**Galton** (F.) Communication on international anthropometry. Bull. de l'Inst. internat. de statist., Rome, 1892, vi, 1 livr., 10-12.—**Garofalo** (R.) L'omicidio in Italia. Scuola positiva, Roma, 1893, iii, 241-247.—**Gatschet** (A. S.) Report of an Indian visit to Jack Wilson, the Payute Messiah. J. Am. Folk-Lore, Bost. & N. Y., 1893, vi, 108-111. — Medicine arrows of the Oregon Indians. *Ibid.*, 111.—**Giglioli** (E. H.) Gli Hei-Tiki dei Maori della Nuova Zelanda. Arch. per l'antrop., Firenze, 1892, xxii, 191-203, 1 pl. — La trebbiatrice guernita di selci taglienti (tribulum degli antichi) tuttora in uso a Cipro, nel s. e. dell'Europa, in Asia minore e nell'Africa boreale. *Ibid.*, 1893, xxiii, 57-64, 1 pl. — Sue due nuovi *Hei Tiki* litici della Nuova Zelanda. *Ibid.*, 83-86. — Di alcuni ex voto amuleti, ed altri oggetti litici adoperati nel culto di Krishna, sotto la forma di Jagan-Natha, a Puri in Orissa, India. *Ibid.*, 87-89.—**Gilman** (B. I.) Syllabus of lectures on the psychology of pain and pleasure. Am. J. Psychol., Worcester, 1893-4, vi, 3-60.—**von der Goltz**. Zauberei und Hexenkünste, Spiritismus und Shamanismus in China. Mitth. d. deutsch. Gesellsch. f. Nat. u. Völkerk. Ostasiens, Yokohama, 1893, vi, 1-36, 13 pl.—**Grinnell** (G. B.) Pawnee mythology. J. Am. Folk-Lore, Bost. & N. Y., 1893, vi, 113-130.—**Grunwedel** (A.) Die Zaubermuster der Orang Semang nach den Materialien des Herrn Hrolf Vaughn Stevens bearbeitet. Ztschr. f. Ethnol., Berl., 1893, xxv, 71-100, 4. pl.—**Guibert**. De l'aptitude à l'imitation. Bull. Soc. d'anthrop. de Par., 1893, 4. s., iv, 315-327.—**Gurrieri** (R.) La sensibilità nella donna normale e nella prostituta.

Arch. di psichiat., etc., Torino, 1893, xiv, 185-190.—**Haeckel** (E.) Die Urbewohner von Ceylon. Deutsche Rundschau, Berl., 1893, xix, 367-385.—**Hagen** (A.) Les indigènes des îles Solomon. Anthropologie, Par., 1893, iv, 192.—**Hamilton** (A. McL.) Mental medicine. The treatment of disease by suggestion. Century, N. York, 1893, xlv, 430-435.—**Herve** (G.) La race des Troglodytes magdaléniens. Rev. mens. de l'École . . . d'anthrop. de Par., 1893, iii, 173-188.—**Hirtz** (E.) Recherches sur le plan horizontal de la tête. Bull. Soc. d'anthrop. de Par., 1893, 4. s., iv, 386-388.—**Hitchocock** (R.) Shinto, or the mythology of the Japanese. Rep. Smithsonian. Inst. 1891, Wash., 1892, 489-509. — The ancient burial mounds of Japan. *Ibid.*, 511-523, 30 pl.—**Hoernes** (M.) Grundlinien einer Systematik der prähistorischen Archäologie. Ztschr. f. Ethnol., Berl., 1893, xxv, 49-70.—**Hoffman** (W. J.) Notes on Pennsylvania German folk-medicine. Science, N. Y., 1893, xxi, 355.—**Holmes** (W. H.) Traces of glacial man in Ohio. Archaeologist, Waterloo, Ind., 1893, i, 161-170.—**Hough** (W.) The Bernadou, Allen, and Jouy Korean collections, in the U. S. National Museum. Rep. Smithsonian. Inst. 1891, Wash., 1892, 429-432, 7 pl.—**Hovelacque** (A.) et **G. Herve**. Le crâne Morvandean. Rev. mens. de l'École d'anthrop. de Par., 1893, iii, 160-166.—**de Hoyos Sainz**. Deux cas d'anomalie numérique des doigts. Bull. Soc. d'anthrop. de Par., 1893, 4. s., iv, 179-181.—**de Hoyos Sainz** (L.) et **T. Aranzadi**. Sur l'anthropologie de l'Espagne. *Ibid.*, 199-204.—**v. Ihering** (H.) Bemerkungen zur Urgeschichte von Rio Grande do Sul, zumal über die Caximbo. Verhandl. d. Berl. Anthrop. Gesellsch., Berl., 1893, xxv, 189-196.—**Ireland** (W. W.) On sporadic cretinism. Edinb. M. J., 1892-3, xxxviii, 1018-1022.—**Jackson** (J. H.) Words and other symbols in mentation. Med. Press & Circ., Lond., 1893, n. s., lvi, 205-208.—**Joest** (W.) Ethnographisches und Verwandtes aus Guayana. Internat. Arch. f. Ethnogr., Leiden, 1893, v, Suppl., 3 p., l., 1-102, 8 pl.—**Kirn** (L.) Geistesstörung und Verbrechen.

Festschr. z. Feier. d. . . . Jubil. d. Anst. Illenau, Heidelb., 1892, 77-100.—**von Koffsky** (R.) Ueber ethnologische Forschungen unter den Samoeden nebst einigen eigenen Beobachtungen. Arch. f. Anthrop., Brnschw., 1893, xxii, 96-105.—**Kokane** (I.) [Torsion of the humerus.] Hokuetsu Ikwai Kwaiho, Tokio, 1893, No. 58, 1-36.—**Kovalevsky** (M.) La famille matriarcale au Caucase. Anthropologie, Par., 1893, iv, 259-278.—**Krause** (P. G.) Ueber Spuren menschlicher Thätigkeit aus interglacialen Ablagerungen in der Gegend von Eberswalde. Arch. f. Anthrop., Brnschw., 1893, xxii, 49-55.—**Krauss** (W. C.) A new pododynamometer. N. York M. J., 1893, lviii, 217.—**Kunesow** (S. K.) Ueber den Glauben vom Jenseits und den Todten-Cultus der Tschereissen. Internat. Arch. f. Ethnogr., Leiden, 1893, vi, 89-95.—**Laubach** (C.) A few interesting finds in the Columbian gravels. Archaeologist, Waterloo, Ind., 1893, i, 128.—**Letourneau** (C.) Les Mégalithes à Madagascar. Bull. Soc. d'anthrop. de Par., 1893, 4. s., iv, 175-179. — De l'origine de la circoncision chez les juifs. *Ibid.*, 208-210.—**Liebeault** (A. A.) Streifzüge in das Gebiet der passiven Zustände, des Schlafes und der Träume. Ztschr. f. Hypnot., etc., Berl., 1892-3, i, 129; 155; 202; 223; 264.—**Lindenschmidt** (Ludwig). [1809-1893.] [Biography, by] J. Ranke. Arch. f. Anthrop., Brnschw., 1893, xxii, 1-v.—**Lombroso** (C.) La fossette occipitale chez les prostituées. Compt. rend. Soc. de biol., Par., 1893, 9. s., v, 609. — Ueber ein neues Mutterschaftsorgan und über das Becken des Hottentottenweibes. [Transl.] Wien. med. Wchnschr., 1893, xliii, 741; 786.—**Long** (J. H.) Evil spirits. Pop. Sc. Month., N. Y., 1893, xliii, 357-371.—**Luco** (A.) Anomalies craniennes dans cinq criminels de Santiago. Arch. di psichiat., etc., Torino, 1893, xiv, 333-344.—**von Luschan** (F.) La posizione antropologica degli Ebrei. [Transl. from the German.] Arch. per l'antrop., Firenze, 1892, xxii, 459-470.—**Macgowan** (D. J.) The artificial making of wild men in China. China M. Miss. J., Shanghai, 1893, vii, 79-81.—**Mac-**

- Ritchie (D.)** *Platycnemism in the British Isles.* J. Anthrop. Inst., Lond., 1893, xxii, 399-401.—**Mahoudeau (P.-G.)** *Types Corses.* Rev. mens. de l'École d'anthrop. de Par., 1893, iii, 257-259, 2 pl.—**Man (E. H.)** *Nicobar pottery.* J. Anthrop. Inst., Lond., 1893-4, xxiii, 21-27.—**Manouvrier (L.)** *La volonté.* Rev. mens. de l'École d'anthrop. de Par., 1893, iii, 141-159.—**Mantegazza (P.)** *L'antropologia nell'insegnamento universitario e l'antropometria nella scuola.* Arch. per l'anthrop., Firenze, 1892, xxii, 185-190. — Di alcune recenti proposte di riforme della craniologia. *Ibid.*, 1893, xxiii, 45-55.—**Marandon de Montyel (E.)** *Contribution à l'étude clinique des tatouages chez les aliénés.* Arch. de l'anthrop. crim., Par., 1893, viii, 373-413.—**March (H. C.)** *Polynesian ornament a mythography; or, a symbolism of origin and descent.* J. Anthrop. Inst., Lond., 1892-3, xxii, 307-333, 4 pl.—**Marie (P.)** *Mamelon surnuméraire transmis héréditairement dans une famille; coïncidence avec plusieurs grossesses géminaires; réversion atavique à ou création d'un-type polymaste et polygène (?)* Bull. et mém. Soc. méd. d. hôp. de Par., 1893, 3. s., x, 457-459.—**Mathew (Rev. J.)** *The cave paintings of Australia, their authorship and significance.* J. Anthrop. Inst., Lond., 1893-4, xxiii, 42-52, 4 pl.—**Matthew (G. F.)** *Discoveries at a village of the stone age at Bocabec, N. B.* Bull. Nat. Hist. Soc. of N. B., 1892, No. x, 5-29, 2 pl.—**Measurements** of natives from the Upper Zambesi. J. Anthrop. Inst., Lond., 1893-4, xxiii, 86-88.—**Mercer (H. C.)** *Notes taken in December, 1892, and March, 1893, at the quaternary gravel pits of Abbeville, St. Acheul and Chelles.* Archaeologist, Waterloo, Ind., 1893, i, 121-127. — *Pre-historic jasper mines in the Lehigh Hills.* Pop. Sc. Month., N. Y., 1893, xliii, 662-673. — *Discovery of ancient argillite quarries on the Delaware.* Science, N. Y., 1893, xxi, 317. — *Also, Archaeologist, Waterloo, Ind., 1893, i, 172-174.*—**Meyer (A. B.)** *Nephrite hatchet from British New Guinea.* J. Anthrop. Inst., Lond., 1893, xxii, 398.—**Mindeleff (V.)** *A study of Pueblo architecture, Tusayan and Cibola.* *Is.* 8th Ann. Rep. Bur. Ethnol., 1886-7, Wash., 1891 [1893], 1-228.—**Mitsuwa (T.)** *[Average body weight of Japanese people at different ages.]* *Ijishimpo*, Tokio, 1893, No. 4, 40-48.—**Miwa (N.)** *[Body weight of Japanese at different ages.]* *Ztschr. d. med. Gesellch.* Tokio, 1893, vii, No. 9, 10-18.—**Moreau (P.)** *Le crime à deux.* Ann. méd.-psych., Par., 1893, 7. s., xviii, 14-31.—**de Mortillet (A.)** *Les torques ou colliers rigides.* Rev. mens. de l'École d'anthrop. de Par., 1893, iii, 237-256.—**Myers (A. T.)** and **F. W. H. Myers.** *Mind-cure, faith-cure, and the miracles of Lourdes.* Proc. Soc. Psych. Research, Lond., 1893, ix, 160-209.—**Neumann (I.)** *Das Tätowiren vom medizinischen und anthropologischen Standpunkte.* Wien med. Wehnschr., 1893, xliii, 1169; 1217; 1255; 1300.—**Ohmann-Dumesnil (A. H.)** *Tattooing and its successful removal.* N. York M. J., 1893, lvii, 544-547.—**Olshausen (O.)** *Die angeblichen Funde von Eisen in steinzeitlichen Gräbern.* Verhandl. d. Berl. Gesellsch. f. Anthrop., 1893, 89-121.—**Ottolenghi (S.)** *Il campo visivo nei cretini.* Arch. di psichiat., etc., Torino, 1893, xiv, 256-263, 1 pl.—**Politis (N. G.)** *Greek folk-lore. On the breaking of vessels as a funeral rite in modern Greece.* [Transl. by L. Dyer.] J. Anthrop. Inst., Lond., 1893-4, xxiii, 29-41.—**Powell (J. W.)** *Are there evidences of man in the glacial gravels?* Pop. Sc. Month., N. Y., 1893, xliii, 316-326.—**Frichard (A.)** *One view of heredity.* Bristol M.-Chir. J., 1893, xi, 91-93.—**Pritchett (J. A.)** *Tuberculosis in the negro.* Alabama M. & S. Age, Anniston, 1892-3, v, 386; 421.—**Ranke (J.)** *Ueber Schädel aus Melanesien (Neu Britanien).* Cor.-Bl. d. deutsch. Gesellsch. f. Anthrop., etc., München, 1892, xxiii, 119-122. *Also, transl.:* Arch. per l'anthrop., Firenze, 1893, xxiii, 79-82.—**Ray (S. H.)** *Sketch of Aulua grammar, with vocabularies of Aulua and Lamangkau, Malakula, New Hebrides.* J. Anthrop. Inst., Lond., 1893, xxii, 386-397.—**Read (G.)** *A weighty female infant.* [16½ lbs.] Australas. M. Gaz., Sydney, 1893, xii, 184.—**Regalia (E.)** *Sulla nuova classificazione umana dei*

Prof. G. Sergi. Arch. per l'antrop., Firenze, 1893, xxiii, 91-152.—**Regnault** (F.) De la consanguinité au point de vue médical. Gaz. d. hôp., Par., 1893, lxvi, 945-953.—**Reinach** (S.) La stèle de Kuffarn et les vases d'Oedenburg. Anthropologie, Par., 1893, iv, 182-191.—**Roberts** (C.) On the uses and limits of anthropometry. Bull. de l'Inst. internat. de statist., Rome, 1892, vi, 1. livr., 13-18, 4 diag.—**Roncroni** (L.) La criminalità femminile all'estero. Arch. di psichiat., etc., Torino, 1893, xiv, 350-364.—**Rondeau**. Étude expérimentale sur divers poisons de flèches. Bull. Soc. d'anthrop. de Par., 1893, 4. s., iv, 294-304.—**Rossi** (U.) Sui rapporti tra cervello ed osso occipitale alla nascita. Arch. per l'antrop., Firenze, 1893, xxiii, 17-42, 1 pl.—**Round** (W. M. F.) Criminals not the victims of heredity. Forum, N. Y., 1893, xvi, 48-59.—**Roussel** (T.) Cagots et lépreux. Bull. Soc. d'anthrop. de Par., 1893, 4. s., iv, 149-161.—**Ryder** (J. A.) Energy as a factor in organic evolution. Proc. Am. Phil. Soc., Phila., 1893, xxxi, 192-203. — The inheritance of modifications due to disturbances of the early stages of development, especially in the Japanese domesticated races of gold-carp. Proc. Acad. Nat. Sc., Phila., 1893, 75-94.—**Schaaflhausen** (Hermann). [1816-1893.] [Biography, by] J. Ranke. Arch. f. Anthrop., Brnschw., 1893, xxii, pp. i-xv.—**Schmitt** (É.) Grotte funéraire néolithique à Livry-sur-Vesle (Marne). Bull. Soc. d'anthrop. de Par., 1893, 4. s., iv, 374-376.—**Schrader** (F.) De l'influence des formes terrestres sur le développement humain. Rev. mens. de l'École d'anthrop. de Par., 1893, iii, 205-219.—**Schurtz** (H.) Amulette und Zaubermittel. Arch. f. Anthrop., Brnschw., 1893, xxii, 57-64.—**Seler** (E.) Ueber alt-mexikanischen Federschmuck. Verhandl. d. Berl. Gesellsch. f. Anthrop., 1893, 44-59.—**Sergi** (G.) Sugli abitanti primitivi del Mediterraneo. Arch. per l'antrop., Firenze, 1892, xxii, 343-359. — Relazione del congresso di antropologia e di archeologia preistorica di Mosca. *Ibid.*, 1893, xxiii, 65-79. — [Il metodo del prof. Bogdanov craniometrico.] *Ibid.*, 66-

71.—**Sighele** (S.) La statistica del delinquente associato. Arch. di psichiat., etc., Torino, 1893, xiv, 219-240.—**Silvestre**. Sur quelques instruments provenant de l'Indo-chine. Bull. Soc. d'anthrop. de Par., 1893, 4. s., iv, 364-370.—**Singer** (G.) Die Ruminantien beim Menschen und ihre Beziehung zum Brechact. Deutsches Arch. f. klin. Med., Leipzig, 1892-3, li, 472-504.—**Sloot** (W. E.) Supernumerary breasts in the female. Tr. Kentucky M. Soc., Louisville, 1892, n. s., i, 297-299.—**Smith** (H. L.) An ancient Peruvian water jug. Archaeologist, Waterloo, Ind., 1893, i, 130.—**Societe** d'autopsie, fondée à Paris en 1876; Président-fondateur: Dr. Coudereau; Président-actuel: Dr. J. V. Laborde. Rev. mens. de l'École d'anthrop. de Par., 1893, iii, 233-236, 1 l. fac-simile.—**Some** characteristics of Northwestern Indians. Pop. Sc. Month., N. Y., 1893, xlii, 823-831.—**Somerville** (B. T.) Notes on some islands of the New Hebrides. J. Anthropol. Inst., Lond., 1893-4, xxiii, 2-21, 2 pl.—**Souvenirs** et impressions d'un condamné. Arch. de l'anthrop. crim., Par., 1893, viii, 326-333.—**Spears** (J. R.) Told of an extinct race which built the ancient walls in the Tulerosa valley. The Sun, N. Y., Sept. 3, 1893.—**Spencer** (H.) The inadequacy of natural selection. [From: Contemporary Rev.] Pop. Sc. Month., N. Y., 1892-3, xlii, 799; 1893, xliii, 162. — Professor Weismann's theories. [From: Contemporary Rev.] *Ibid.*, 473-490.—**Stanley** (H. M.) African legends. Fortnightly Rev., Lond., 1893, n. s., liii, 797-828.—**Starr** (F.) Anthropology at the World's Fair. Pop. Sc. Month., N. Y., 1893, xliii, 610-621.—**Stevenson** (J.) Ceremonial of Hasjelti Dailjis and mythical sand painting of the Navajo Indians. *Id.*: 8th Ann. Rep. Bur. Ethnol., 1886-7, Wash., 1891 [1893], 229-285.—**Stieda** (L.) Ueber die verschiedenen Formen der sog. queren Gaumennaht. (Sutura palatina transversa.) Arch. f. Anthrop., Brnschw., 1893, xxii, 1-12, 2 pl.—**Strebel** (H.) Nachtrag zu Studien über Steinjoch. Internat. Arch. f. Ethnol., Leiden, 1893, vi, 44-48, 1 pl.—**Swettenham** (F. A.) Note on the Jacoons. J. Anthropol. Inst., Lond., 1893-4, xxiii, 89.—

Tannery (P.) Recherches sur l'histoire de l'astronomie ancienne. Mém. Soc. d. sc. phys. et nat. de Bordeaux, 1893, 4. s., i, iii-viii, 1-370.—**Tanzi** (E.) La fessura orbitale inferiore. Arch. per l'antrop., Firenze, 1892, xxii, 251-279.—**Tarnowski** (Pauline) and **Lombroso**. Fotografie di criminali russe. Arch. di psichiat., etc., Torino, 1893, xiv, 273-275, 1 pl.—**ten Kate** (H.) Contribution à l'anthropologie de quelques peuples d'Océanie. Anthropologie, Par., 1893, iv, 279-300.—**Thomas** (C. L.) Untersuchung zweier Taunus-Ringwälle. Arch. f. Anthrop., Brnschw., 1893, xxii, 65-72, 2 pl.—**Tooker** (W. W.) Indian names of places in Brooklyn. Brooklyn Daily Eagle Almanac, 1893, 57-60. — Some supposed Indian names of places on Long Island. Long Island Mag., Brooklyn, N. Y., 1893, i, 51-54.—**Topinard** (P.) L'anthropologie aux États-Unis. Anthropologie, Par., 1893, iv, 301-351.—**Tracy** (F.) The language of childhood. Am. J. Psychol., Worcester, 1893-4, vi, 107-138.—**Vall** (E.) Untersuchungen von Verbrechern über die morphologischen Veränderungen der Ohrmuschel. Arch. f. Ohrenh., Leipz., 1892-3, xxxiv, 315-323.—**Van Baalen** (J.) De quelques particularités sur le culte des morts chez les Papouas du Geelvinksbai. Bull. Soc. d'anthrop. de Par., 1893, 4. s., iv, 171-175.—**Vance** (L. J.) Folk-lore study in America. Pop. Sc. Month., N. Y., 1893, xliii, 586-598.—**Vercellio** (F.) Sull' apofisi mastoide. Arch. per l'antrop., Firenze, 1892, xxii, 173-184.—**Vialleton** (L.) Les théories embryologiques et les lois de la biologie cellulaire. Rev. scient., Par., 1893, lii, 103-110.—**Viazzi** (P.) Gli studi sulla donna delinquente in rapporto al diritto civile. Arch. di psichiat., etc., Torino, 1893, xiv, 406-408.—**Virchow** (R.) Photographien sibirischer Bronzen. Verhandl. d. Berl. anthrop. Gesellsch., Berl., 1893, xxv, 38-41. — Kopf eines menschlichen Anencephalen der angeblich in Steinkohle gefunden ist. *Ibid.*, 41-43. — Ein restaurirter Schädel von Megara Hyblaea. *Ibid.*, 205.—**Wagner**. Ueber den Cretinismus. Mitth. d. Ver. d. Aerzte in Steiermark, Graz, 1893, xxx, 87-101.—**von**

Wagner (F.) Das Keimplasma; eine Theorie der Vererbung von A. Weismann. Biol. Centralbl., Leipz., 1893, xlii, 331; 389.—**Waldeyer**. Skelet eines etwa 50 jährigen Zwerges. Verhandl. d. Berl. Anthrop. Gesellsch., Berl., 1893, xxv, 210.—**Weir** (J.), Jr. Viraginity and effemination. Med. Rec., N. Y., 1893, xlii, 359.—**West** (G. M.) Antropometrische Untersuchungen über die Schulkinder in Worcester, Mass., Amerika. Arch. f. Anthrop., Brnschw., 1893, xxii, 13-48.—**Willocks** (M.) Die Vererbung erworbener Eigenschaften vom Standpunkte der landwirtschaftlichen Tierzucht in Bezug auf Weismann's Theorie der Vererbung. Biol. Centralbl., Leipz., 1893, xlii, 420-427.—**Wilfer** (L.) Die Vererbung der geistigen Eigenschaften. Festschr. z. Feier. d. . . . Jubil. d. Anst. Illenau, Heidelberg, 1892, 161-186.—**Wood** (A. J.) Three cases of sporadic cretinism. Austral. M. J., Melbourne, 1893, n. s., xv, 165-175.—**Wood** (C. E. S.) Famous Indians. Portraits of some Indian chiefs. Century, N. York, 1893, xlii, 436-445.—**Wulffing** (E. A.) Ueber den kleinsten Gesichtswinkel. Ztschr. f. Biol., München u. Leipz., 1892-3, n. F., xi, 199-202.—**Zaborowski**. Le crime et les criminels à Paris. Rev. scient., Par., 1893, li, 609-617. Also *Abstr.*: Compt. rend. Acad. d. sc., Par., 1893, cxvi, 1004-1007. — La Mika-opération; la mutilation du pénis des Australiens pratiquée jadis sur les chevaux de Saint-Domingue; le Kalang des Dayaks de Bornéo. Bull. Soc. d'anthrop. de Par., 1893, 4. s., iv, 165-170. — Superstitions médicales. (Deux faits minuscules.) *Ibid.*, 170. — Le squelette de Thiais et le squelette de Villejuif; composition chimique de leurs os déterminée par M. Adolphe Carnot; leur ancienneté relative. *Ibid.*, 181-199.—**Zampa** (R.) Fulghini ed Araucani. Arch. per l'antrop., Firenze, 1892, xxii, 361-366. — Delle anomalie nella antropologia criminale. *Ibid.*, 367-370.—**Zimmermann** (Helen). Reformatory prisons and Lombroso's theories. Pop. Sc. Month., N. Y., 1893, xliii, 598-609.—**Zoja** (G.) Intorno ad uno scheletro antico della Lapponia. Boll. scient., Pavia, 1893, xv, 1-9.

CHARLES COLCOCK JONES.

Col. Charles Colcock Jones, who died at his home in Augusta, Georgia, July 19, 1893, was a model citizen and a man of national reputation as an orator and scholar. He was born in Savannah, Georgia, on the 28th of October, 1831, his boyhood being spent in Liberty county, Georgia, on the estates of his distinguished father, the Rev. Charles C. Jones. The early studies of Colonel Jones were pursued at home under tutors and partly under the immediate supervision of his father. He took a partial course at South Carolina College, Columbia, and graduated with distinction from Nassau Hall, Princeton, New Jersey, in 1852, and in 1855 from the Harvard Law School with the degree of LL.B.

In 1854 Colonel Jones began the practice of law in Savannah, and on the breaking out of the civil war, in 1861, was mayor of that city. He served through the war as an officer of artillery with particular distinction, and in 1865 removed to New York city, where he practiced law for ten years, continuing with renewed vigor his career as a writer in the departments of history and science. He returned to Georgia in 1877, taking up his residence in the suburbs of Augusta, where, in addition to his professional labors, he found time to prosecute his favorite studies, producing numerous works of value and some of high importance.

His historical and biographic works are numerous and valuable, covering nearly all periods of American history, though referring in the main to the south and more especially to his native State. Of especial interest to ethnologists may be mentioned: *Dead Towns of Georgia*, 1878; *De Soto's March through Georgia*, 1880; *Negro Myths from the Georgia Coast*, 1888; and *History of Georgia*, 1883, in two volumes, the first treating of the aboriginal and colonial periods and the second dealing especially with the revolutionary epoch and the organization of the State.

The archeologic and antiquarian works of Colonel Jones have contributed more, perhaps, than any other group of his numerous publications to establish his national and international reputation. The following examples of this class are particularly worthy of mention: *Aboriginal Studies in Georgia*; *Primitive Manufacture of Spear and Arrow-points on the Savannah river*; *Silver crosses from an Indian grave mound*; and *Primitive storehouses of the Creek Indians*, published in the Smithsonian reports. Others are: *Monu-*

mental Remains in Southern Georgia, Savannah, 1859; Ancient Tumuli on the Savannah river, New York, 1868; Ancient Tumuli in Georgia, Worcester, Massachusetts, 1869; and Antiquities of the Southern Indians, New York, 1873. The last-mentioned work, a volume of 520 pages, fully and handsomely illustrated, is the most important of these and gave him a world-wide reputation. It is a hand-book with all students of American archeology and altogether one of the most valuable contributions yet made to the subject. During the last decade this work has been in a large measure rewritten by the author and much new material and many important illustrations added.

It was but natural that the historian and archeologist should turn his attention toward the collection and preservation of the materials of history and archeology. His collections of autographs, autograph letters, and portraits illustrative of American history, and especially of the revolutionary period, are extensive and of great value. His library comprises some 4,500 well-selected volumes, 200 of which have been illustrated by himself at great expense. It is especially rich in works relating to Georgia. Of particular interest and value to the scientific world are his collections of aboriginal relics, which embrace some 20,000 objects illustrative mainly of the arts, historic and prehistoric, of the southern Indians. These valuable treasures are now in possession of his son, Mr. Charles E. Jones.

It is remarkable that from one family should spring two sons, Colonel Jones and his younger brother, Dr. Joseph Jones, now of New Orleans, with tastes turned and abilities exerted in a direction so rare—two men to whom the science of man should owe more than to all others in the south combined. Colonel Jones was a member of numerous literary and scientific societies at home and abroad and the degree of LL.D. was twice conferred upon him.

Physically Colonel Jones was a man of exceptionally fine type; in character he was noble and in disposition gentle and charitable. His intellectual endowments were of the highest order, and in the varied field of his activities the community, the state, and the country will not readily find an equal. His power as an orator was commanding, his literary style fluent and forcible, his judgment all but unerring, and his energy and industry the marvel of his associates. His many works are a fitting and lasting monument to his memory.

W. H. HOLMES.

NOTES AND NEWS.

AMONG THE DISTINGUISHED FOREIGNERS who came to America to study the World's Columbian Exposition in Chicago were Prince Roland Bonaparte and Dr. Paul Topinard, who were in America during the months of April and May. Both of these gentlemen have visited our country previously and they are both familiar with the English language.

On returning to Paris, Dr. Topinard contributed to *L'Anthropologie* a paper of fifty pages upon the science of anthropology in the United States. In his opening chapter he tells us that when a boy he lived eight years in the States, and confesses that the country impressed him more favorably then than it does now, which may be attributed either to a change in the country itself or to transformations which have taken place in the Doctor during the last forty years. Dr. Topinard gives a tolerably good running review of the science of anthropology in America, though he omits the names of Albert Gallatin, Horatio Hale, Squier and Davis, the two Bancrofts, Dr. Washington Matthews, Colonel Charles C. Jones, and others whom he might include in this honored list.

In speaking of the care bestowed by the National Museum upon costume and the neglect of anatomical characters in setting up the figures of Indians, it is quite certain that the Professor has overlooked the immense albums of Indian photographs in Washington, taken front and side face, after the method of Prince Bonaparte and other European ethnologists. There is a standing order by the Commissioner of Indian Affairs that every Indian delegation that comes to Washington shall be so photographed at the Bureau of Ethnology, and these instructions are carefully carried out.

It is quite true that the subject of craniometry has been neglected in America recently, for the reason that the results have not been satisfactory and seem to be rather a kind of will-o'-the-wisp, which ever leads the inquirer on to more numerous and intricate measurements. Be that as it may, the subject has received due consideration at the World's Columbian Exposition, under the management of Professor Putnam.

In the enumeration of collections relating to anthropology and ethnology Dr. Topinard has omitted those from Cleveland, Cincinnati, St. Louis, and San Francisco. He speaks in a very appreciative way of the work done in America, and commends especially the labelling of material and the efforts made in all the collections to make them as available as possible for instruction.

In speaking of the separation, at Washington, of the archeological and ethnological specimens, a remark is made that these two sciences are really one, and that the material ought not to be kept apart. This is no doubt true. There is no place in the world where this unity of the two sciences is more strenuously maintained than it is in the city of Washington.

Perhaps the most important point in Dr. Topinard's paper is his summary of the discussions which have taken place recently regarding early man in America. In all his remarks upon this subject he takes the side of Dr. Abbott, Dr. Cresson, Professor Wright, and other advocates of the high antiquity of man, and has wholly failed to comprehend the purport of numerous recent and striking developments pointing in the other direction. Professing to approach the subject with unbiased mind, his writing bears every evidence of the dominance of preconceived opinions.

There are two distinct questions now agitated by American anthropologists, based on the recent investigations of Mr. W. H. Holmes. The first of these relates to the status of culture indicated by the rude paleolith-like flaked stones, thought by the finders to have been obtained from glacial formations. These objects are, on closer examination, found in every case to be identical with the ordinary rejects of the arrow-maker of the region concerned, and our archeologists argue that since these are not verified implements they are not, even if found in the gravels, a competent index of the grade of culture reached by the peoples who made them. Up to this time no reliable proofs of the actual status of the hypothetical glacial culture have been obtained. The whole number of rudely flaked stones reported from the gravels in place does not exceed one hundred, and the finders have, as a rule, been either unskilled observers of glacial phenomena or without a due appreciation of the consequences of superficial observation.

The second question relates to the evidence of man's antiquity in America. Mr. Holmes has carefully and systematically examined

the testimony furnished by Dr. Abbott in the Delaware valley, Dr. Metz and Mr. Mills in the Ohio valley, and Miss Babbitt on the upper Mississippi—the only evidence of importance yet presented. The result is that a large part of the evidence is wholly thrown out, and the remainder is shown to be so meagre and embarrassed as to leave the affirmative proposition practically unsupported. The indications point to the conclusion that the finds of shaped stones referred to the gravels in place are modern shop refuse, involved in the talus deposits in comparative recent times.

Dr. Topinard, in his review, does not reflect the status of conviction with respect to this question now prevalent among its adherents in America. This position seems to be that of waiting for new and confirmatory evidence. This is indicated by the fact, not observed by our learned visitor, that there was not when he was in Chicago, and there is not there now, one single American specimen concerning which the owner or exhibitor was willing to risk his reputation by calling it definitely a “paleolith.”

This new condition of affairs is due largely to the researches of Mr. Holmes, who while demonstrating the total inadequacy of the evidences of glacial paleolithic man in America has presented his views with commendable modesty. The time has come, however, when the earnest student of the history of man should be correctly informed, and this leads me to make, with great diffidence, a suggestion. Dr. Topinard calls Dr. Abbott the Boucher de Perthes of America. No one has been more diligent in his archeological work than Dr. Abbott, and he himself has said that he laid no claims to infallibility in regard to any provisional conclusions to which he had come concerning the geological horizon of the Trenton finds. In the light of what has recently transpired in America it would be well for our friends in France specially to review the grounds of their opinions with reference to such excavations as those at Abbeville and Chelles. I do not come to the hasty conclusion that European archeology is to be written in the light of American discovery, but I do wish to declare that a sufficiency of new light has been thrown upon our work in this continent to make it worth while for our friends abroad to examine afresh the foundations of their belief. It is quite within the limits of possibility that Boucher de Perthes may turn out to have been the Dr. Abbott of France.

Dr. Topinard speaks very kindly with respect to the work of American confrères, and the want of appreciation of the latest archeological labor done here is to be attributed to his own predilections, to his intimate association with the friends of paleolithic man when he was in America, and to his very short stay in the opening month of the Exposition, when so little of the precious material was really arranged.

Dr. Topinard should come again when he can remain longer and when he will have time to go patiently over the evidence brought out in recent explorations of the Bureau of Ethnology.

OTIS T. MASON.

MASHONALAND TEMPLE ORIENTATION.—I have examined two ruined temples of the Zimbabwe period and style, situated at the confluence of the Lotsani and Limpopo rivers, in south latitude $22^{\circ} 39' 42''$, east longitude $28^{\circ} 16' 30''$. The temples show the same system of orientation and geometrical construction as the great temple at Zimbabwe. I cleared the bush from the more perfect of the two temples of the Lotsani and made a careful measurement of many of the radii of the one curve of which it consists. I oriented directly from the center to the curve and saw the sun from that point set just to the left of the middle of the main doorway. On correcting the position of the sun for its decrease in declination during the seventeen days which had elapsed since the solstice, I found that it would set at the solstice exactly in a line with the center of the arc and the middle of the doorway. This direct measurement and observation should remove any doubt as to the applicability of our theory of the construction of the plans of these temples.—*Swan, in the Geographical Journal, London, Sept., 1893, pp. 263, 264.*

FINGER PRINTS IN INDIA.—The commander-in chief of the military forces of India has approved the proposal to employ impressions in ink of the fore, middle, and ring fingers of each recruit as a means of identification.

BOOK NOTICE.

Bohmische Korallen aus der Goetterwelt: Folkloristische Boerse-berichte vom Goetter-und Mythenmarkte. Von Friedrich S. Krauss. (His temporibus satiram scribere non difficile.) Wien, 1893. Verlag der Gebrueder Rubinstein (vii Neubaug, 29). Druck von Philipp & Kramer, Wien. 8vo, pp. viii-147.

The title of this latest work of Dr. Krauss, the distinguished Slavic ethnologist, requires some explanation for western readers. "Bohemian corals" is a term used in Austria to designate brass beads, trumpery jewelry, and other things of deceptive value, about equivalent to that of our own wooden nutmegs. In this book of about 150 pages the doctor has turned aside from his usual labor of love in elucidating the rich folklore and epic traditions of Servia and Croatia to produce one of the bitterest satires it has been our fortune to read for a long time. To those who know the conditions under which Krauss and other gifted men of his race exist in Europe the reasons for much of this bitterness are not hard to understand.

In the first part he discusses at length several philologic "corals." Among others he tells us of a learned professor whose ambition it was to produce a monumental dictionary of the South Slavic dialects, and who was accustomed to make every casual stranger from an out-of-the-way district stand and deliver whatever he had in the way of obscure words or phrases. On one occasion he got hold of the doctor's servant and, according to his usual method, set him down before a bottle of wine, reinforced by fifty kreutzers, and called upon him for "uncommon words." Thus importuned, the rascal, as he himself afterward boasted, set his brains to work to "invent such words as never were heard," and when the doctor afterward visited the professor he found him in ecstasies over having obtained "sixteen entirely new words in a single hour!"

Another instance is that of a Gallo-Roman figure bearing for an inscription the single word *Encina*, which for some time was the subject of learned controversy among French savants. One asserted that it represented the Gallic god of death, while another proved by

the inscription that it was instead an image of the deity of fate or necessity, and bolstered up his opinion with philologic roots and analogies and rules for consonantal changes, from Sanskrit down to Cornish, to the extent of several pages, until it was discovered that the antique was modern, and that the mysterious inscription was simply the name of the maker, who did business at 56 Boulevard Montparnasse, in Paris.

The rest of the book is largely taken up with a sarcastic criticism of an "Introduction to the History of Slavic Literature," by Dr. Gregor Krek, professor of Slavic philology in the University of Graz. The professor, partly, it seems, from personal animus, had passed strictures upon some of the doctor's earlier works in the same field, and the doctor retaliates by dissecting his book from end to end, challenging not only his acquaintance with Slavic mythology, but also his knowledge of the languages involved.

Incidentally he gives us some curious etymologies of geographic or national nicknames. In Servia the Germans are called *Wosokter*, from *Was sagt er*, "What does he say!" the expression most frequently heard from the Germans when addressed in the strange language of the country. The German-American Jews know the Irish as Bezimer, or "egg people," from the fact that their German name *Irlaender* suggests *Eierland*, or "egg land." In the same way Slavonia and Croatia are sometimes known as *Schweine-land*, or "hog land," from a misconception of the meaning of *Sauland*, an earlier name for that region, from its proximity to the river Sau or Save. This reminds one of the process by which the Spanish Rio de las Animas Perdidas became the French Rivière Purgatoire and finally the American "Picketwire."

JAMES MOONEY.

"PIN-WELLS AND RAG-BUSHES."—In a paper on this subject, read before the British Association by E. Sidney Hartland, it was suggested that the object of the usages was union with the divinity, to be achieved by the perpetual contact with the god of some article identified with the worshipper.

THE
CITIZENSHIP PRIZES
OF THE
ANTHROPOLOGICAL SOCIETY OF WASHINGTON

NOTICE OF POSTPONEMENT

At the request of many correspondents, it has been decided to extend the time for the preparation of the essays offered in competition for the Citizenship Prizes from November 1, 1893, to March 1, 1894.

In order that competitors whose essays have already been submitted may not suffer by the extension, it has been provided that those who desire may withdraw and modify or rewrite their essays. On application to Mr. Weston Flint, 1101 K street N. W., Washington, D. C., essays already in hand or received up to November 1 will be mailed postpaid to authors, with return postage.

The Commissioners of Award, to whom will be submitted the essays offered in competition for the Citizenship Prizes of THE ANTHROPOLOGICAL SOCIETY OF WASHINGTON, are as follows ;

Anthropologist: Dr. DANIEL G. BRINTON, of the University of Pennsylvania ;

Educator: Dr. DANIEL C. GILMAN, President of Johns Hopkins University ;

Jurist: MELVILLE W. FULLER, Chief Justice of the United States Supreme Court ;

Statesman: ADLAI E. STEVENSON, Vice-President of the United States ;

Not specified : Dr. ROBERT H. LAMBORN.

All other conditions of the competition remain unchanged.

W J MCGEE,
Chairman Prize Committee.

OTIS T. MASON, *President.*

WESTON FLINT, *Secretary Board of Managers.*

WASHINGTON, D. C., *October 25, 1893.*

INDEX TO VOLUME VI.

	Page.
Aboriginal remains of the Piedmont and valley region of Virginia.	415
Abstract of proceedings of the Anthropological Society.....	218
Africa, eastern, slavery in	136
American Folk-lore Society.....	64
American Indians, polysynthesis in the languages of the.....	381
Ancient graves of the Vazimba	69
Annamite betel-chewing and salutation	422
Anthropologic literature, bibliography of.....	108, 211, 331, 449
Anthropology at the Madison meeting.....	435
Anthropology in America, Topinard on.....	459
Archeologic explorations in Michoacan, Mexico.....	79
Archeologic find in Arizona.....	283
Archeological verification of a Tusayan legend.....	363
Are the Maya hieroglyphs phonetic?	241
Arizona, recent archeologic find in.....	283
Arizona, prehistoric irrigation in.....	323
A-wa'-to-bi: An archeological verification of a Tusayan legend.....	363
 Babcock, William H. On geographic nomenclature of the District of Columbia.....	29
Bechuanaland, absence of crime in.....	282
Bell, Alexander Melville. On simplified spelling.....	162
Betel-chewing by the Annamite	422
Bibliography of anthropologic literature.....	108, 211, 331, 449
Blodgett, James H. The rural school problem	71
Blood cement used by the ancient Hurons.....	322
Boas, Franz. Notes on the Chinook language.....	55
Borrowed Indian songs.....	376
Bourke, John G. Primitive distillation among the Tarascoes.....	65
Brinton lectures	206
British New Guinea, stone-axe currency in.....	84
 Canary islanders, whistle language of the.....	115
Central American ceremony which suggests the snake dance of the Tusayan villagers.....	285
Chamberlain, A. F. Further notes on Indian child-language.....	321
Chinook language, notes on the.....	55
Citizenship prizes of the Anthropological Society.....	223, 330
Columbian historical exposition in Madrid.....	271

	Page.
Congress of anthropology at World's Fair.....	423
Cranial deformities in Toulouse.....	320
Crime, absence of, in Bechuanaland.....	282
Cult society, Menomoni.....	407
Currency, stone-axe, in British New Guinea.....	84
Deadly microbe and its destruction.....	15
Distillation, primitive, among the Tarascoes.....	65
Distribution of stone implements in the tide-water country.....	1
District of Columbia, geographic nomenclature of the.....	29
Dorsey, J. Owen. Rising and falling of the sky in Siouan mythology, 64; On polysynthesis in Indian languages.....	403
Dutcher, B. H. Piñon gathering among the Panamint Indians....	377
Election, the last town, in Pompeii.....	225
Evolution of the art of working in stone.....	307
Fewkes, J. Walter. A Central American ceremony which suggests the Snake dance of the Tusayan villagers, 285; A-wa'-to-bi: an archeological verification of a Tusayan legend.....	363
Finger-prints in India.....	462
Fire, time-keeping by light and.....	207
Fletcher, R. Bibliography of anthropologic literature, 108, 211, 331, 449; The poet—is he born, not made?.....	117
Folk-lore congress.....	270
Folk-lore publication.....	270
Force, M. F. Origin of certain mound relics.....	113
Fowke, Gerard. Aboriginal remains of Virginia.....	415
Frey, S. L. Historic and prehistoric Mohawks.....	277
Fuegians, physical anthropology of the.....	306
Further notes on Indian child-language.....	321
Gatschet, A. S. The navel in local names, 53; Some mythic stories of the Yuchi Indians, 279; The Terraba language, 408; The Gundestrup silver vase.....	414
Geographic nomenclature of the District of Columbia.....	29
Glacial period, man and the.....	85
Graves, ancient, of the Vazimba.....	69
Gregory, John M. On simplified spelling.....	169
Gundestrup silver vase.....	414
Harris, W. T. On simplified spelling.....	156
Hewitt, J. N. B. Signaling by means of exploding leaves, 78; Whistle language of the Canary Islanders, 115; A Kachgar-Chinese menu, 136; Slavery in eastern Africa, 136; Blood cement used by the ancient Hurons, 322; Polysynthesis in Indian languages, 331; La mensuration du cou.....	408

	Page.
Hieroglyphs, Maya, are they phonetic?.....	241
Historic and prehistoric Mohawks	277
Hodge, F. W. Prehistoric irrigation in Arizona.....	323
Hoffman, W. J. Menomoni cult society	407
Holmes, W. H. Distribution of stone implements in the tide-water country, 1; On geographic nomenclature of the District of Columbia, 29; The World's Fair congress of anthropology, 423; Obituary of Charles Colcock Jones.....	457
Hough, Walter. Time-keeping by light and fire, 207; Columbian historical exposition in Madrid	271
Hurons, blood cement used by the ancient	322
Indiana Academy of Science.....	84
Indian child-language, further notes on	321
Indian songs, how borrowed.....	376
Irrigation, prehistoric, in Arizona.....	323
Jadeite and nephrite, means of distinguishing, by specific gravity ..	210
Japanese minor religious practices	376
Jones, Charles Colcock, obituary of	457
Kachgar-Chinese menu.....	136
Kuskarawaokes of Captain John Smith.....	409
Lamb, D. S. The deadly microbe and its destruction.....	15
Language, Chinook, notes on the	55
Languages of the American Indians, polysynthesis in the	381
Last town election in Pompeii	225
Leaves, signaling by means of exploding.....	78
Liberian customs.....	337
Light and fire, time-keeping by.....	207
Local names, the navel in	53
Madrid, Columbian historical exposition in.....	271
Makanga customs.....	70
Man and the glacial period.....	85
March, F. A. On simplified spelling.....	137
Mashonaland temple orientation.....	462
Mason, Otis T. Topinard on anthropology in America.....	459
Maturity ceremonial of Mission Indians.....	221
Maya hieroglyphs, are they phonetic?	241
McGee, W. J. Man and the glacial period, 85; Anthropology at the Madison meeting.....	435
McGuire, J. D. On the evolution of the art of working in stone...	307
Means of distinguishing jadeite and nephrite by specific gravity ...	210
Menomoni cult society.....	407

	Page.
Mensuration du cou	408
Menu of the Kachgar-Chinese	136
Meyer, A. B. Means of distinguishing jadeite and nephrite	210
Michoacan, Mexico, archeologic explorations in	79
Microbe and its destruction	15
Mission Indian maturity ceremonial	221
Mohawks, historic and prehistoric	277
Mooney, James. On geographic nomenclature of the District of Columbia, 29; Recent archeologic find in Arizona	283
Mound relics, origin of certain	113
Mythic stories of the Yuchi Indians	279
Mythology, Siouan, rising and falling of the sky in ...	64
 Navajo, the	345
Navel in local names	53
Nephrite, means of distinguishing jadeite and, by specific gravity ..	210
Nomenclature, geographic, of the District of Columbia	29
Notes on the Chinook language	55
 Origin of certain mound relics	113
Owen, W. B. On simplified spelling	173
Owens, John G., death of	206
 Panamint Indians, pifion gathering among the	377
Pennsylvania-German society	407
Peters, E. T. On simplified spelling	177
Phillips, W. Hallett. On geographic nomenclature of the District of Columbia	29
Physical anthropology of the Fuegians	306
Pilling, James C. On simplified spelling	182
Pifion gathering among the Panamint Indians	377
Pin-wells and rag-bushes	463
Plancarte, F. Archeologic explorations in Michoacan, Mexico	79
Poet, the,—is he born, not made?	117
Polysynthesis in Indian languages	381
Pompeii, last town election in	225
Powell, J. W. On simplified spelling	193
Prehistoric irrigation in Arizona	323
Primitive distillation among the Tarascoes	65
Prizes for citizenship essays	223, 330
Proceedings of the Anthropological Society	218
 Rag-bushes, pin-wells and	463
Religious practices of the Japanese	376

	Page.
Rising and falling of the sky in Siouan mythology.....	64
Rural school problem	71
Rust, Horatio N. Mission Indian maturity ceremonial	221
Salutation of the Annamite.....	422
School problem, the rural	71
Scott, Charles P. G. On simplified spelling.....	180
Signaling by means of exploding leaves.....	78
Simplified spelling: A symposium	137
Siouan mythology, rising and falling of the sky in.....	64
Slavery in eastern Africa	136
Smith, Benjamin E. On simplified spelling.....	186
Snake dance of the Tusayan villagers, a Central American ceremony which suggests the.....	285
Songs, Indian, how borrowed.....	376
Spelling, simplified: A symposium.....	137
Spofford, A. R. On simplified spelling.....	149, 195
Stephen, A. M. The Navajo	345
Stetson, G. R. Tattooing in Tunis.....	282
Stone-axe currency in British New Guinea.....	84
Stone, evolution of the art of working in.....	307
Stone implements, distribution of, in the tide-water country.....	1
Tarascoes, primitive distillation among the	65
Tattooing in Tunis	282
Terraba language.....	408
Thomas, Cyrus. Are the Maya hieroglyphs phonetic?.....	241
Time-keeping by light and fire.....	207
Tooker, Wm. Wallace. The Kuskarawaokes of Captain John Smith.....	409
Topinard on anthropology in America.....	459
Toulouse, cranial deformities in.....	320
Trobriand islands, women of the.....	70
Tunis, tattooing in	282
Tusayan legend, archeological verification of a.....	363
Tusayan villagers, a Central American ceremony which suggests the Snake dance of the.....	285
Vase of silver from Gundestrup.....	414
Vazimba, ancient graves of the.....	69
Virginia, aboriginal remains in	415
Ward, Lester F. On geographic nomenclature of the District of Columbia.....	29
Welling, James C. The last town election in Pompeii	225

	Page.
Whistle language of the Canary Islanders	115
Whitney, W. D. On simplified spelling.....	190
Women of the Trobriand islands.....	70
World's Fair congress of anthropology.....	423
Yuchi Indians, mythic stories of the.....	279

BOOK NOTICES.

Evidences of Man in the Drift (Doughty), 85.—Man and the Glacial Period (Wright), 85.—Contributions to North American Ethnology, volume 7: A Dakota-English Dictionary by Stephen Return Riggs. Edited by James Owen Dorsey, 96.—Atlas der Völkerkunde (Gerland), 98.—The Land of the Cliff Dwellers (Chapin), 100.—Bibliography of the Algonquian Languages (Pilling), 101.—Bibliography of the Athapascan Languages (Pilling), 105.—Some Strange Corners of our Country (Lummis), 106.—Hindu Literature; or the Ancient Books of India (Reed), 206.—The Song of the Ancient People (Proctor), 340.—Finger Prints (Galton), 341.—The Ruined Cities of Mashonaland (Bent), 342.—Excavations in Bokerly and Wansdyke, Dorset and Wilts, volume iii (Pitt-Rivers), 344.—Boehmische Korallen aus der Goetterwelt (Krauss), 463.

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